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# SOVIET GROSS CAPABILITIES FOR ATTACK ON THE US AND KEY OVERSEAS INSTALLATIONS AND FORCES THROUGH MID-1959

*Submitted by the*

**DIRECTOR OF CENTRAL INTELLIGENCE**

*The following intelligence organizations participated in the preparation of this estimate: The Central Intelligence Agency and the intelligence organizations of the Departments of State, the Army, the Navy, the Air Force, The Joint Staff, the Atomic Energy Commission, and the Federal Bureau of Investigation.*

*Concurred in by the*

**INTELLIGENCE ADVISORY COMMITTEE**

*on 6 March 1956. Concurring were the Special Assistant, Intelligence, Department of State; the Assistant Chief of Staff, Intelligence, Department of the Army; the Director of Naval Intelligence; the Director of Intelligence, USAF; the Deputy Director for Intelligence, The Joint Staff; the Atomic Energy Commission Representative to the IAC; and the Assistant Director, Federal Bureau of Investigation.*

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# SOVIET GROSS CAPABILITIES FOR ATTACK ON THE US AND KEY OVERSEAS INSTALLATIONS AND FORCES THROUGH MID-1959

## THE PROBLEM

To estimate Soviet gross capabilities to attack the continental United States and certain US installations and forces overseas, as of January 1956 and mid-1959.[1]

## SCOPE

This estimate is made as a contribution to the study of Soviet net capabilities to attack the continental United States and is *not* intended to consider all the aspects of a general war. Overseas installations and forces are considered only insofar as they contribute directly to the defense of the continental United States (e.g., as bases for interception of the attack or for counterattacks calculated to reduce Soviet capabilities against the continental United States). The estimate does not take into account competing demands for the allocation of Soviet efforts against the strengths of any nation but the US or against all the strengths of the US that might be involved in the initial stages of a general war. Consequently it does not estimate the degree to which Soviet effort will be allocated to the attack of the continental US or to the attack of US installations and forces overseas or to the attack of any non-US installations and forces overseas.

## FOREWORD

The problem of estimating Soviet capabilities three years or more in the future cannot be treated exclusively in terms of present indications of how these capabilities are developing. Current evidence is incomplete and sometimes even fragmentary. Moreover, this estimate is more than usually difficult in that its terminal date approximates the estimated date of emergence of a major Soviet threat in the guided missile field. For these reasons, we are obliged to make our estimate of future capabilities not only on the evidence at hand but also on the basis of judgments of how Soviet leaders may assess their future requirements.

[1] By gross capabilities is meant the probable maximum scale of attack by existing forces, or by the forces estimated to be likely to exist at a future date, taking into account operational factors, but not considering combat attrition.



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The judgments which underlie our estimate of Soviet gross capabilities in 1959 are: (a) that throughout the period of this estimate the Soviet rulers will regard it mandatory to strengthen their capabilities to attack US nuclear retaliatory power wherever located, both in the US and overseas; (b) that the Soviet rulers will consider that, although they will acquire increasing guided missile capabilities throughout the period, they must rely primarily on aircraft carrying nuclear weapons for long range attacks which will have to penetrate an ever-improving defense; and, consequently, (c) that the Soviet rulers will devote a substantial effort to the production of long-range bombers.

These judgments are supported by much current evidence. We believe them the soundest which can be made at this time. There are, however, considerations which require us to regard the Soviet gross capabilities estimated in this paper as subject to revision as the period advances: (a) the USSR may revise the size of its Long-Range Aviation, its bomber production goals, or the future balance between the types and categories of its bomber aircraft; (b) the USSR may judge it advantageous to concentrate its efforts on the rapid development of guided missile weapons systems; and (c) the greatly increasing yield of nuclear weapons, and Soviet estimate of possible changes in the quality of the defenses to be penetrated, will each affect Soviet judgment of its requirements as to the number and types of delivery vehicles.

On these grounds we feel it necessary to emphasize that the gross capabilities described in this paper are those which the USSR *could* acquire, and which we believe it is *likely* to acquire by 1959, but we cannot say with confidence that these are the capabilities which it *will have* at that date.

## CONCLUSIONS

1. *Objectives.* In conducting initial attacks against the US and key overseas installations and forces, the USSR would probably through 1959 have the following major military objectives:

*a.* To destroy or neutralize US capabilities for nuclear warfare;

*b.* To deliver attacks on US and overseas military installations, forces, and land and sea lines of communication in order to prevent effective operational employment of US military forces; and

*c.* To deliver attacks on urban, industrial, political, and psychological targets in the US in order to reduce to the maximum extent practicable the mobilization of US military and industrial strengths. *(Para. 49)*

2. *The Surprise Factor.* In order to prevent or reduce nuclear retaliation, the USSR would almost certainly attempt to attack with a minimum of warning and yet at the same time to deliver an attack of sufficient weight to destroy or neutralize US nuclear capabilities. The USSR could not count upon being able to achieve surprise against both the continental US and US overseas bases, but it would almost certainly attempt to do so. *(Paras. 50–53)*



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## Methods and Scale of Attack Against the US

3. We believe that in attacks on the US through 1959 the USSR would place chief reliance upon aircraft carrying nuclear weapons. Missiles launched from submarines might be an important supplement to nuclear attacks by aircraft, but the risk of disclosure of intent would probably deter their large-scale use. Clandestine delivery of weapons of mass destruction, as well as BW and CW weapons, would probably be employed only on a highly selective basis in an initial attack. *(Para. 54)*

4. *In 1956.* Present Soviet capabilities for air attack on the continental US are restricted by the small numbers of operational heavy bombers, the limited availability of megaton yield weapons, the limited capacity of forward bases, and the probable lack of an operational inflight refueling capability. We estimate that the USSR could at present launch an initial strike of about 600 bombers against the US, of which as many as 500 could reach target areas. A small number of these could be carrying nuclear weapons with yields up to a few megatons. (For estimated coverage of the US by these aircraft under various conditions, see maps in Annex B.) *(Paras. 12–13, 56, 69)*

5. *In 1959.* We estimate that by mid-1959 the USSR will have some 400 BISON [2] and 300 BEAR aircraft in operational use. Also, by mid-1959 the capacity of the forward staging areas and Leningrad could have been increased to permit the entire Soviet long-range bomber force to be launched simultaneously. Moreover, in 1959, the USSR could have developed a substantial inflight refueling capability, permitting it to launch a number of heavy bombers from interior bases on two-way missions. The Leningrad base area could be used for some of the heavy bombers making initial unrefueled attacks on the US. Under these circumstances, the USSR in mid-1959 could launch about 815 mission aircraft in an initial attack, of which as many as 640 could arrive in target areas. Of these aircraft 415 would be BISON and BEAR heavy bombers on two-way missions and 225 BADGER medium bombers on one-way missions. By this time a substantial number of these bombers could be carrying weapons with yields up to 10 megatons or more. (See maps in Annex B.) *(Paras. 12, 60, 71)*

6. Should the USSR elect to use only heavy bombers in an initial strike against the US in 1959, about 630 could be launched if only home bases were used. About 500 could arrive in target areas. If bombers were staged through forward bases, the number launched and the

[2] Description of Soviet aircraft types:

| US designation | Description | Soviet designation | Nearest US equivalent |
|---|---|---|---|
| BISON | 4 engine jet heavy bomber | ..... | B52 |
| BEAR | 4 engine turbo-prop heavy bomber | ..... | ... |
| BULL | 4 engine piston medium bomber | TU–4 | B29 |
| BADGER | twin-engine jet medium bomber | ..... | B47 |
| BEAGLE | twin-engine jet light bomber | IL–28 | ... |
| BOSUN | twin-engine jet light bomber | TU–14 | ... |
| CAMEL | twin-engine jet transport | ..... | ... |



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number arriving in target areas would be about 530 and 420, respectively. *(Para. 72)*

7. Submarine-launched guided missiles might be an important supplement to nuclear attacks by aircraft in any Soviet attack plan. These missiles could reach many important targets up to a distance of 500 n.m. from the launching submarines, though with a decreasing accuracy at ranges in excess of 200 to 250 n.m. The scale of attack would depend upon considerations which suggest the employment of only a small portion of the submarines and missiles which could be available in 1959. *(Paras. 43, 54, 74–75)*

## Methods and Scale of Attack Against Overseas Targets

8. The USSR would have a wide range of capabilities for attack on key US installations and forces overseas. At present, principal reliance for initial attacks would probably be placed on Soviet medium, light, and fighter bombers, many of which could be carrying nuclear weapons. By 1959 guided missiles, including those launched from submarines, may be the preferred weapon against many of these targets. The increasing mobility and nuclear capability of the large Soviet ground and supporting air forces make them a threat to many US overseas installations and forces in operations immediately following initial attacks. In all overseas areas, attacks by clandestine means and sabotage would also be employed. *(Paras. 12, 55)*

9. Having launched the attack against the continental US indicated in paragraph 4, the USSR would have available for use in 1956 against overseas targets about 300 mediums (mostly BULLS) and 2,900 jet light bombers. By 1959, assuming the attack against the continental US indicated in paragraph 5, the number of aircraft available for attacking targets overseas would be about 330 jet medium and about 3,100 jet light bombers. Large numbers of these could be carrying nuclear weapons. *(Paras. 12, 83, 85)*

10. At present, a Soviet attack against overseas targets probably could also employ 350 n.m. ballistic missiles. In 1956, missiles with a range of 850–900 n.m. could begin to be available as well. However, the small number of missiles probably available, the low yield of their nuclear warheads, and their performance limitations would seriously limit Soviet operational capabilities in this field during the early part of the period. Some submarine-launched missiles might also be used against selected overseas targets to supplement aircraft and ground-launched missile attacks. By 1959, Soviet missile capabilities will probably have increased markedly as a result of greater numbers of these weapons available, the higher yield of the nuclear warheads, and their improved accuracy and reliability. The USSR could by then also have ready for series production a 1,600 n. m. intermediate-range ballistic missile. Large-yield nuclear warheads for ballistic missiles would probably become available in 1959–1960. (For target coverage, see map 22, Annex B.) *(Paras. 12, 86–88)*

11. The USSR could employ ground, airborne, and amphibious forces against Alaska and certain key US overseas installations and forces simultaneously with, or shortly after, initial bomber and missile strikes. However, the Soviet decision as to how and when to use these capabilities, as well as its clandestine and



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sabotage capabilities, would probably be strongly influenced by the Soviet desire to obtain strategic surprise, a consideration which weighs heavily against their employment prior to the time initial air attacks were detected. *(Paras. 89–91)*

# DISCUSSION

## MAJOR FACTORS AFFECTING SOVIET CAPABILITIES

### I. AVAILABILITY OF MASS DESTRUCTION WEAPONS

12. *Nuclear Weapons.* The Soviet atomic energy program, directed primarily toward the production of nuclear weapons, will continue to receive special emphasis during the period of this estimate. By the end of 1955 the USSR had tested small, medium, and large-yield weapons.[3] We estimate that the USSR could now have nuclear weapons deliverable by aircraft with yields ranging from five KT to a few megatons. It will probably continue to work on large-yield weapons as well as on smaller-yield and small-dimension weapons. By straightforward research and development techniques, substantial progress can be made in increasing the yield and also in reducing the size and weight of the 1.6 megaton weapon tested in 1955. By mid-1959 the USSR could have nuclear weapons deliverable by aircraft with yields ranging from 0.5 KT to 10 megatons or more. By then it might also have high-yield warheads for intermediate range (1,600 n.m.) surface-to-surface ballistic missiles.

13. Within the indicated technological limits, Soviet military requirements will govern the allocation of available fissionable material to various types of weapons. The present number of weapons of greater yield than one MT is considered limited, since it is probable that their production was not begun before late 1955. By mid-1959 the only limitation would be the available supply of U–235. Annex D (Restricted Data) provides the basic information required and the method by which possible variations in the Soviet nuclear weapons stockpile can be calculated. The annex also includes an illustrative stockpile within the estimated availability of fissionable material. It must be emphasized that this illustration is not an estimate of the most probable composition of the Soviet nuclear stockpile — the available evidence is not adequate to justify any specific estimate — but is an example only, based on the assumptions prefacing the stockpile tabulation.

14. *Radiological Warfare.* During the period of this estimate, it is most unlikely that the USSR will be able to stockpile militarily significant quantities of radioactive materials for use in radiological warfare weapons. However, the USSR will possess nuclear weapons capable of producing widespread radioactive fall-out, and these weapons could be used primarily for that purpose.

15. *Biological Warfare.* The USSR possesses all the necessary basic knowledge for the production of most BW agents and devices for their effective dissemination. There is evidence that the USSR is engaged in a BW research and development program with primary emphasis on anthrax, tularemia, plague, and brucellosis as antipersonnel bacterial agents. We believe that foot and mouth disease and rinderpest would be considered as the primary antilivestock agents, although conclusive evidence of such Soviet BW research is lacking. No information is available concerning possible anticrop agents. Since it is not feasible to stockpile large quantities of most BW agents in prolonged storage, most

[3] The 1955 test series included airbursts with yields of about 200 KT and 1.6 MT, an underwater burst of about 20 KT, and two other tests of about 5 KT and 25 KT.



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operational requirements would have to be supplied from production facilities.

16. *Chemical Warfare.* The USSR accumulated large stocks of standard CW agents and munitions during World War II. We believe that it is maintaining stockpiles of these toxic agents adequate for large-scale employment in military operations.

17. In regard to other CW agents, the USSR moved a GA nerve gas producing plant and the GB pilot plant from Germany to the Soviet Union in 1947. In addition to possessing the physical facilities, the USSR has the technical knowledge to produce both GB and GA. We believe that the USSR could have been producing GA since 1949, although we have no firm evidence it has done so. The problems involved in stockpiling GB are greater, but we estimate that the USSR has the ability to produce and stock it, at least in limited quantity. The USSR has also had access to openly published information on psychogenic drugs and other potential CW agents, including the method of synthesis. Minute quantities of psychogenic drugs are capable of making individuals indifferent to their surroundings and of inducing apprehension and confusion. We estimate that the Soviet Union has the technical ability to produce such drugs for use as chemical warfare agents.

18. The USSR had chemical disseminating devices and munitions prior to World War II, some of which were suitable for aerial delivery at speeds up to 300 mph. We estimate the USSR could produce devices and munitions for high speed delivery of many of its toxic agents.

## II. WEAPONS DELIVERY SYSTEMS — AIRCRAFT

### Soviet Long-Range Aviation

19. Soviet Long-Range Aviation is estimated to have had, as of 1 January 1956, an over-all actual strength in operational units of 1,145 bomber aircraft, including 760 BULL piston medium bombers, 310 BADGER jet medium bombers, about 40 BISON jet heavy bombers, and about 35 BEAR turbo-prop heavy bombers.[4] There is evidence that BISON have been assigned to operational units, but the evidence concerning assignment of BEAR aircraft is tenuous. All Long-Range Aviation units are based in the European USSR except the 3rd Long-Range Air Army, which is in the Soviet Far East and has an estimated actual strength of about 220 BULLS.

20. We lack sufficient intelligence to estimate with a confidence that satisfies us the planned future size of Soviet Long-Range Aviation, or the planned future balance between the types and categories of bomber aircraft. In the absence of any evidence indicating reduction in the number of long-range units, we estimate that the current strength will be carried forward throughout the period, with new types being phased in as they become available. It also seems probable that by 1959 actual will be closer to authorized strengths. We estimate, moreover, that during this period the USSR is unlikely to introduce into operational units any medium or heavy bomber types which have not already appeared. We believe that the USSR will devote a substantial effort to the production of medium and heavy bombers. Based on available intelligence and on our estimate of Soviet capabilities to produce and requirements for a long-range bomber force, we believe that the USSR will produce about 700 BISON and 460 BEARS through mid-1959. Accordingly, actual strengths in mid-1959, as compared with current actual strengths, would be as shown below:

Estimated Operational Strength of Long-Range Aviation Mid -57

| Type | 1 January 1956 | | Mid-1959 |
|---|---|---|---|
| BULL | 760 | 300 | 0 |
| BADGER | 310 | 650 | 700 |
| BISON | 40 | 200 | 400 |
| BEAR | 35 | 150 | 300 |

The serviceable BULLS phased out of Long-Range Aviation would be available for a variety of uses, including reconnaissance (particularly naval reconnaissance), augmentation of Satellite and Chinese Communist air forces,

[4] Radii-ranges and other performance data estimated for Soviet bomber types are given in Annex C.



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conversion for tanker use or other special purposes, or reserve. The USSR will have no appreciable reserves of other medium or heavy bomber types.

21. *Inflight Refueling.* The USSR would probably require an inflight refueling capability if it intended to employ all of its present or a considerable portion of its prospective bomber force against the continental US without resorting to one-way missions. Evidence does not indicate that in the USSR inflight refueling has gone beyond the experimental stage. Development of a fleet of tanker aircraft, modification of mission aircraft fuel systems, and considerable operational training would be necessary before a significant inflight refueling capability would be achieved. The numerous BULL aircraft being phased out could be converted to tankers, but because of their limited speed, altitude, and fuel capacity their use would probably be restricted to refueling medium bombers. Converted BISON, BEAR, or possibly CAMEL types would be more suitable as tankers. The USSR could also develop a new type specifically for use as a tanker, but we have no evidence thus far that it is doing so. The USSR could have, in 1959, an inflight refueling capability adequate to meet the requirements of Soviet Long-Range Aviation for attacks on the US.

## Light Bomber Forces

22. For attacks on targets up to 700 miles from Bloc bases, the USSR has available a substantial jet light bomber force consisting of the types designated as BEAGLE and BOSUN. The BEAGLE is the standard light bomber of both Soviet Tactical Aviation and Naval Aviation. We estimate that all Soviet jet light bombers have the capability of delivering nuclear weapons. Jet light bombers assigned to Soviet Naval Aviation are also capable of carrying out specialized naval missions such as torpedo attacks and minelaying.

Estimated Jet Light Bomber Strength in Operational Units*

| | January 1956 | Mid-1959 |
|---|---|---|
| Tactical Aviation | 2,230 | 2,250 |
| Naval Aviation | 653 | 850 |
| Total | 2,883 | 3,100 |

* See Annex C for estimated performance characteristics of these aircraft.

23. During 1956 the USSR may also begin to have operational an improved jet light bomber, perhaps a twin-jet swept-wing type. In addition, the speed and altitude performance of some BEAGLES has been increased by the installation of higher thrust engines. This, however, has not resulted in a significant change in radius/range. We estimate that by 1958 BOSUN will have been phased out of operational service and replaced by either the BEAGLE or the new light bomber.

## Base Areas

24. We estimate that in all there are some 400 operational airfields in the Sino-Soviet Bloc with permanent surfaced runways of 5,000 feet or longer:

| | Minimum Runway Lengths (feet) | | | | | |
|---|---|---|---|---|---|---|
| | 9,000 | 8,000 | 7,000 | 6,000 | 5,000 | Total |
| USSR | 4 | 28 | 3 | 93 | 41 | 169 |
| European Satellites | 2 | 49 | 37 | 35 | 1 | 124 |
| Asiatic Communist Countries | 0 | 2 | 17 | 63 | 25 | 107 |
| | 6 | 79 | 57 | 191 | 67 | 400 |

25. Given standard conditions (normal take-off technique and take-off engine power, no wind, sea level elevation, temperature 59 degrees F., permanent surfaced runway) we estimate take-off distances for Soviet long-range bombers as follows:

| Type | Take-off Weight (lbs.) | Ground Run (ft.) | Ground Run to Clear 50-ft. Obstacle (ft.) |
|---|---|---|---|
| BULL | 140,000 | 5,230 | 7,825 |
| BULL (modified) | 135,750 | 4,800 | 7,125 |
| BADGER | 150,000 | 4,200 | 6,300 |
| BADGER (improved) | 170,000 | 4,800 | 7,100 |
| BISON | 365,000 | 6,400 | 9,100 |
| BISON (improved) | 365,000 | 5,300 | 8,200 |
| BEAR | 300,000 | 6,000 | 9,000 |

(For the effect of lower temperatures, see paragraph 63.)



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26. There are approximately 25 airfields in the USSR believed to be home bases for operational Long-Range Aviation bomber units, three in the Far East and the remainder in the European USSR. In addition, a number of airfields associated with command and/or training units, factory production and delivery, and testing and development are in effect an integral part of the base structure of Soviet Long-Range Aviation. Moreover, many other airfields in the Sino-Soviet Bloc have runways suitable for medium bomber operations and some have runways suitable for heavy bombers.

27. In areas where airfield development can be easily observed, such as the European Satellites, the Soviet air forces have provided runway lengths in excess of estimated requirements for the assigned aircraft. There is some evidence of runway development at airfields identified as home bases for Long-Range Aviation units. Assuming similar construction practices throughout the USSR, we estimate that concrete runways at BULL home bases have been standardized at lengths between 7,800 and 8,200 feet. Little additional modification of these existing bases would be required for operation of BISON or BEARS. However, if the number of new heavy bombers estimated for 1959 actually appears in operational units, the Soviet long-range home base system will probably require expansion and development in terms of number of fields, runway lengths, and other factors.

28. World War II practices suggest that the USSR probably would depend upon auxiliary airfields to insure maximum aircraft dispersal away from home bases in event of hostilities. The actual existence of such auxiliary fields within the Soviet Long-Range Aviation base structure cannot be verified from available intelligence. In fact, the base structure at present is such that, were Soviet Long-Range Aviation to require airfields for dispersal in European USSR, it would have to utilize airfields outside the current home base operational areas. This would mean moving into either the more vulnerable perimeter areas of the USSR or withdrawing farther into the interior. Physical limitations on dispersal, and probable requirements for limiting ground stay to a minimum, would make dispersal and revetment practices unlikely for long-range bombers at forward staging bases in the Arctic areas.

29. Because of the range limitations of available bombers, the launching of strikes against North America in 1956 probably would be limited to operations staged through one or more of six base areas within Soviet-controlled territory — the Chukotski Peninsula, the Kamchatka Peninsula, the Central Arctic area, the Kola Peninsula, the Leningrad area, and the Baltic-East German area. Even the BEAR turbo-prop heavy bomber would have to be launched from these areas in order to hit any but the most northern US targets, unless refueled in flight or employed on one-way missions. Airfields suitable for long-range bombers exist in each of these six areas, although Long-Range Aviation units are stationed only in the Leningrad area. [5]

30. Airbase development over the past few years in the potential forward staging areas has improved the capability of these bases for supporting long-range bomber staging operations. In the Baltic-East German area, only minor additional construction and development of air facilities at existing bases would be required. In the Kamchatka, Kola, Chukotski, Central Arctic, and Leningrad areas, there are 20 bases believed suitable for staging long-range bombers. Four or five of these may be capable of supporting sustained operations. Runway lengths and surfaces at many of these bases are known, but information is meager concerning load-bearing capacity, aircraft servicing, maintenance, storage, and personnel facilities at almost all of these airfields.

31. There are, however, indications that airfield development in the forward base areas is continuing, and we estimate that it is within Soviet capabilities to develop adequate facilities for sustained long-range bomber operations in any of these areas by 1959. For example, we estimate that by 1959, with the con-

[5] Annex A and Annex E (limited distribution) cover air facilities, weather conditions, and base capacities in these base areas.



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struction facilities and personnel now in the area concerned, three new airfields suitable for long-range bomber staging-operations could be developed in the Kola and Leningrad areas, and two each in Chukotski, Central Arctic, and Kamchatka. Improvement of support facilities at already existing potential staging bases in these areas could be carried out concurrently without major interference with the construction effort.

32. In each of the forward areas there are bases, in addition to those considered suitable for staging long-range bombers, which could be utilized for fighters, light bombers, and transports for which the USSR would also have a requirement in any operation conducted from the forward areas. In certain areas, however, there are only a few of these additional bases.

## Other Factors Affecting Soviet Air Operations

33. *Navigation.* The USSR has available through open sources virtually complete target and navigation data on North America and its approach routes. It is even probable that in the event of a surprise attack certain Western electronic navigational aids would be available during at least part of the flight. Similarly, meteorological reports, including profile data at all altitudes, are regularly broadcast in the United States and Canada in simple cipher. It is also possible that clandestinely placed navigational beacons may be used for aircraft homing. We estimate that Soviet blind-bombing and navigational radar equipment is capable of equal or better performance than the US World War II equipment which the USSR acquired. The current Soviet training program points to continuing improvement in air crew proficiency.

34. Soviet Long-Range Aviation is probably receiving training in the use of advanced navigation systems and techniques. Some Soviet crews are almost certainly capable of navigation to the most difficult assigned targets in the US. Most crews are probably capable of navigating with sufficient accuracy to reach major US cities and industrial centers. We estimate that by 1959 Soviet Long-Range Aviation will have considerably increased its overall proficiency in long-range navigation.

35. *Bombing Accuracy*

*a. Visual Bombing.* We estimate that many BULL crews, and crews which have been fully trained in the newer turbo-jet and turbo-prop bombers, are capable of attaining the following visual bombing accuracies (in the case of the BULL, figures are applicable up to 30,000 feet only):

| Altitude (ft.) | CEP (ft.) |
|---|---|
| 50,000 | 2,900 |
| 40,000 | 2,100 |
| 30,000 | 1,400 |
| 20,000 | 900 |
| 10,000 | 400 |

Most long-range bomber crews will probably achieve the above level of proficiency by mid-1959.

*b. Radar Bombing.* BULL units generally are estimated to be capable of the following accuracies in radar bombing:

| Altitude (ft.) | CEP (ft.) | |
|---|---|---|
| | Well-defined targets | Poorly-defined targets |
| 30,000 | 4,000 | 5,500 |
| 20,000 | 2,000 | 3,500 |
| 10,000 | 1,000 | 1,750 |

Because of the limitations of the radar installed in the BULL, no significant improvement in the above accuracies is likely. However, we estimate that the newer aircraft, as well as affording more stable bombing platforms, probably have improved radar. This could result in the radar bombing accuracies listed below. By mid-1959, most crews in newer type bombers will probably be able to achieve these accuracies.

| Altitude (ft.) | CEP (ft.) | |
|---|---|---|
| | Well-defined targets | Poorly-defined targets |
| 50,000 | 3,100 | 5,600 |
| 40,000 | 2,300 | 4,300 |
| 30,000 | 1,500 | 3,000 |
| 20,000 | 1,000 | 2,000 |
| 10,000 | 500 | 1,000 |



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36. We estimate that jet light bomber CEPs are the same as those for Long-Range Aviation. If the Soviet SHORAN type navigation system were employed as a bomb control system, bombing accuracies of about plus or minus 100 feet could be achieved at a range of 100 n.m. from the transmitter. Soviet ground fire control radar could be used with appropriate modifications to develop a precise short-range bombing system. This system could have a range of 15–20 nautical miles.

37. *Reconnaissance.* It is possible that during the interval between now and mid-1959 the USSR might build up a pattern of reconnaissance of US and allied early warning lines, not only to determine their location, capabilities, and vulnerabilities, but also to delay recognition of the approach of an actual attack. It is unlikely that the USSR would jeopardize surprise by unusual reconnaissance activity before an actual attack. However, there would be a requirement for the surveillance of sea areas from which US and allied carrier task forces could attack the USSR. Such reconnaissance would probably be the primary responsibility of Naval Aviation, to which BULL or other long-range aircraft could be assigned or made available as required. Even if long-range bomber types were not committed in attacks against carrier task forces, their reconnaissance data would be valuable for the direction of submarine and surface forces and for the planning of attacks by Soviet jet light bomber and torpedo aircraft. Post-strike reconnaissance of US targets would probably be done by mission aircraft.

38. *Weather Forecasting.* The USSR has for years devoted considerable emphasis to both short-period and long-period meteorological forecasting and has achieved a high degree of success. We believe that it has the forecasting capability to support long-range air operations. This capability plus extensive experience in meteorological research in the extreme northern latitudes, weather reporting facilities in Siberia and on ice floes in the Central Arctic basin, and constant access to current North American weather reports and forecasts should enable the USSR to predict both route and target weather with reasonable accuracy.

39. *Electronic Countermeasures (ECM).* The USSR has had access to several types of World War II US defensive radar and to some US jamming equipment. Since 1950, a number of instances of Soviet use of Chaff have been observed, and recently the use of active airborne jammers has been noted. We estimate that the USSR now has at least limited quantities of both ground and airborne equipment for jamming radar up through the X-Band (10,000 mc/s) and possibly higher. Such equipment would include active, passive, and confusion devices. We have no evidence of Soviet use of decoys, but consider it to be within their capabilities. We also estimate that the USSR has a ground-based jamming capability to interfere seriously with radio communication between the US and its overseas bases and forces. During the period 1956–1959 the USSR will probably continue to improve its jamming capability by the development of equipment covering a wider range of frequencies and by increased effectiveness of jamming operations. [6]

40. *Evasion of US Radar.* The USSR almost certainly knows at least the general capabilities of US early warning radar equipment, coverage provided by the network, and weak and strong points of the system. With such knowledge it might expect that properly planned attacks could reduce the chance of detection by US radar, particularly if the attacking aircraft made penetrations where radar coverage was limited or nonexistent, or if the physical limitations of the radar equipment were exploited. However, the use of some evasion techniques, particularly low altitude penetration, would require acceptance of reduced range or bomb load.

## III. WEAPONS DELIVERY SYSTEMS — GUIDED MISSILES [7]

41. We have no evidence that the USSR now has any offensive guided missile available for operational use. During the period of this

[6] For a detailed discussion, see Annex F (limited distribution).

[7] For a detailed study see NIE 11-12-55, "Soviet Guided Missile Capabilities and Probable Programs," 20 December 1955.



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estimate, it will probably rely primarily upon aircraft for the delivery of nuclear weapons, because of the probable lower relative reliability and accuracy of missile systems and the lower nuclear yield obtainable from missile warheads. Based on US experience, we estimate that at present only 40–60 percent of Soviet missiles would reach target areas, but by 1959 their reliabilities will almost certainly be improved. However, we believe that during this period the USSR will devote a high priority to the development of offensive missiles, and that it will begin to stockpile various types as acceptable reliabilities are achieved and as the improvement of warhead yields tends to compensate for relative missile inaccuracies. By 1959 the USSR will probably have in operational use several types of missiles with nuclear warheads suitable for attacks on overseas installations and forces and for submarine, shipborne, or airborne attack on the continental United States. However, an intercontinental ballistic missile (ICBM) will probably not become available before 1960–1961.

## Submarine-Launched Guided Missiles

42. Although there is no firm evidence that the USSR has developed a submarine-launched guided missile capability, we estimate that it could now have submarines equipped for this purpose. Any of the long-range submarine types could be equipped to carry one or two guided missiles in topside stowage. We estimate that a submarine the size of the Soviet Z class could be constructed to accommodate 6 V–1 type or 4 turbo-jet Regulus I type missiles internally. A submarine the size of the "W" class could possibly accommodate 3 V–1 types or 2 of the larger missiles.

43. We estimate that both of the above types of nonballistic missiles could currently be available for launching from submarines. The V–1 could be an improved version of the German V–1, having a range up to 200 nautical miles with a 3,000-pound warhead. At this range this missile could have a CEP of roughly 3 n.m., with inertial guidance. Radar track-radio command guidance could be provided to a distance of 100 miles from the launching submarine, or an advanced guidance submarine could be used. Using radar track-radio command guidance, a CEP of about one to two nautical miles could be achieved, depending on how accurately the submarine's position were fixed. With a 3,000-pound warhead, the turbo-jet missile could have a range of 500 n.m. Radar track-radio command guidance could be provided for about 200–250 n.m. from the guidance submarine, with a CEP of about one to two n.m., depending on the accuracy of navigation. Inertial guidance could be used, but at maximum range would result in a CEP of about 10 miles. All missiles which could be launched from submarines could also be launched from surface vessels, including merchant ships.

## Ground-Launched Surface-to-Surface Missiles

44. Several additional missile types could now be, or could become, available for launching from land bases. Current information indicates that surface-to-surface ballistic missiles are being given a high priority in the Soviet research and development program. We estimate that, in addition to shorter range ballistic missiles, the USSR could have had since 1954 an operational ballistic missile with a range of 350 n.m. and a CEP of 2 n.m. We believe that in 1956 it could have ready for series production a single-stage ballistic missile with a range of 850–900 n.m. and a CEP of 3–4 n.m. In 1958–1959 the USSR could have ready for series production an intermediate-range ballistic missile (IRBM) with a range of about 1,600 n.m. and a CEP of 3–4 miles. Only a few of these latter could be available for operational use by trained units in mid-1959, but, if the USSR were willing to accept a reduced range of 1,400 n.m., this missile could be ready for series production as early as 1957. Only low-yield nuclear warheads would be available for these medium and intermediate-range missiles until about mid-1959, when large-yield nuclear warheads could begin to become available.

## Air-Launched Missiles

45. The USSR is now technically capable of attacking targets with rocket-propelled glide bombs launched from long-range aircraft.



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These bombs could now have low-yield nuclear warheads. However, their use would be limited to well-defined targets, good visibility conditions, and a maximum range of 20 n.m. During 1956–1957, an improved version with a 50 n.m. range could become available. This missile could be equipped with a semiactive homing guidance system for use against ships or other well-defined targets. By 1958, high-yield nuclear warheads could also be available.

## IV. WEAPONS DELIVERY SYSTEMS — CONVENTIONAL FORCES

### Ground and Tactical Air Forces

46. Any key US installations and forces overseas within range would be subject to attack by Soviet Bloc tactical air forces. These targets would also be threatened by the advance of Bloc ground forces with tactical air support. It is estimated that, at the present time, Bloc ground forces are composed of 175 Soviet and about 230 other Bloc line divisions. We believe that, in general, Soviet line divisions are maintained at 70 percent or less of authorized strengths. It is estimated that, for air support of its ground and naval operations, the USSR currently has an actual strength of approximately 12,000 aircraft in Tactical (Frontal) Aviation and Naval Aviation. Of this total, approximately 9,600 are jet aircraft. For mid-1959, actual aircraft in these operational units is estimated at about 14,600, of which 13,000 will be jets. In addition there are about 3,000 military aircraft in the European Satellites (4,000 by 1959) and about 2,600 in China and North Korea (3,400 in 1959).

### Airborne and Amphibious Forces

47. The USSR also has considerable airborne and amphibious forces which could be used to attack certain US overseas installations and Alaska. There are an estimated 10 Soviet airborne divisions, and some ground troops have received training in air transport operations. Although the USSR still has only twin-engine transports, it is estimated that Soviet Aviation or Airborne troops could lift 9,000 troops in an initial parachute attack. The USSR lacks specialized assault landing craft and support ships for other than short-range amphibious operations. It is estimated that the USSR could at present lift up to three divisions for an initial amphibious assault on Japan or Korea.

### Naval Forces

48. The intense and rapid naval construction program carried out by the USSR during the last six years has provided it with an increasingly significant offensive capability. The program for construction of major combatant units has been limited to light cruisers, destroyers, and submarines. At present major surface vessels in the Soviet Navy are estimated to number 225, including 6 heavy cruisers, 22 light cruisers, and almost 200 destroyers. By 1959, we estimate that the USSR will have about 300 major surface vessels, including some 35 cruisers, 265 destroyers, and possibly one or two capital ships. We estimate that, in view of the known submarine building facilities, the Soviet submarine force, currently consisting of about 420 submarines of all types, could be strengthened by the addition of about 520 new long and medium range boats by mid-1959. However, we have no intelligence to indicate that the USSR will in fact produce this number of submarines or to indicate the planned future strength of the Soviet submarine force. Considering such factors as the probable phasing out of older types and the possible introduction of new types, including nuclear-powered submarines, we believe that by mid-1959 the Soviet submarine force will consist of about 780 boats of all types, including about 600 postwar design long and medium range submarines. The capabilities of this force will probably be improved by a limited modernization of older classes (including the installation of snorkel). In addition, some submarines may be adapted for missile launching. Intelligence is lacking on a number of factors essential to the development of such a fleet. We lack adequate information on mobile and permanent logistical support. Little is known of the operating efficiency of the submarine force, which is probably still inferior to that of US and German forces of World War II, but performance standards will probably rise during this period.



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# PROBABLE SOVIET GROSS CAPABILITIES

## V. SOVIET OBJECTIVES AND METHODS OF ATTACK

49. In conducting initial attacks against the US and key overseas installations and forces, the USSR would probably have the following major military objectives:

*a.* To destroy or neutralize US capabilities for nuclear warfare;

*b.* To deliver attacks on US and overseas military installations, forces, and land and sea lines of communication in order to prevent effective operational employment of US military forces; and

*c.* To deliver attacks on urban, industrial, political, and psychological targets in the US in order to reduce to the maximum extent practicable the mobilization of US military and industrial strengths.

We believe that these Soviet objectives will remain the same throughout the period of this estimate.

### Implications of Soviet Efforts to Achieve Surprise

50. In order to prevent or reduce nuclear retaliation the USSR would almost certainly attempt to attack with a minimum of warning. A maximum Soviet attack on the continental US and key overseas installations and forces, involving utilization of all or most of the capabilities discussed below, would require such substantial preparations as to almost certainly result in the loss of surprise. If, however, the USSR attempted to attack without warning it would probably be forced to accept the following major restrictions: (a) no large-scale mobilization of additional units; (b) no large-scale redeployment of Soviet air, naval, or ground forces to reinforce peripheral dispositions; and (c) no unusual movement of Soviet air, naval, or ground forces which would be likely to indicate the imminence of attack. The effect of these restrictions would be reduced, however, if redeployment and high readiness were achieved gradually.[8]

51. Thus, the USSR would have to balance the advantages of surprise against the required weight of attack. In planning initial attacks on US and overseas targets, priority of Soviet effort would be largely determined by Soviet recognition of the need for neutralizing the most immediate threat to Soviet security — a nuclear attack by US forces. These Soviet attacks, therefore, would probably be directed primarily toward those areas and against those forces which comprise the US nuclear strike capability. The Soviet timetable would probably call for almost simultaneous assaults on other target systems, subject to the overriding requirement that these assaults not give warning of the initial attacks against US nuclear strike capabilities.

52. Even in planning attacks directed mainly against US nuclear strengths, the USSR will probably continue to be faced with a difficult choice as to the relative priorities to be given to attacks on key targets in the US itself as opposed to key targets overseas. This dilemma stems from the fact that Soviet planning will not only be concerned with the relative nuclear threats presented by continental US forces as compared with US overseas forces, but also with estimating the relative success which could be achieved against continental US as contrasted with overseas targets. The USSR could not count upon being able to achieve surprise against both the continental US and US overseas bases, but it would almost certainly attempt to do so.

53. The continental US will almost certainly be a high priority Soviet target. However, Soviet operational planning for the initial strikes will probably also be strongly influ-

[8] For extended discussion of the problem of achieving surprise, see NIE 11-6-55, "Probable Intelligence Warning of Soviet Attack on the US Through Mid-1958," 1 July 1955.



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enced by the threat to Soviet security from US nuclear capabilities overseas, and by the fact that the Soviet attack capability against such targets is relatively high. We have no basis for estimating what the distribution of Soviet effort between US continental and overseas bases would be. We believe that Soviet planning would probably be calculated to achieve an optimum effect, i. e., the maximum *over-all* reduction of US nuclear retaliatory capabilities, wherever located.

### Methods of Attack

54. We believe that through 1959 the USSR would place chief reliance in attacks on the continental US upon aircraft carrying nuclear weapons, since this form of delivery would offer the best chance of combining a minimum warning with a significant weight of attack. Missiles launched from submarines might be an important supplement to nuclear attacks by aircraft, but limitations on target coverage and the risk of premature disclosure of intent would probably deter their large-scale use in an initial attack. The clandestine delivery of nuclear and other weapons of mass destruction might also be attempted, but, because of the risk of premature disclosure of intent, these forms of attack would probably be employed only on a highly selective basis in an initial attack. Sabotage of certain key installations might occur concurrent with or immediately following the initial attack.

55. The USSR would have a much wider range of capabilities for attack on key US overseas installations and forces than on the US itself. At present, principal reliance for initial attacks would probably be placed on Soviet medium, light, and fighter bombers. By 1959 guided missiles, including those launched from submarines, may be the preferred weapon against many of these targets. The USSR's possession of very large numbers of submarines would permit their concentration against US naval striking forces. The increasing mobility and the probable growing nuclear capability of the large Soviet ground and supporting air forces make them a threat to many US overseas installations and forces in operations immediately following initial attack. In all overseas areas, clandestine attacks and sabotage would also be an incidental form of Soviet attack, and might in some locations be highly effective.

## VI. CAPABILITIES TO ATTACK THE US [9]

### Attacks by Aircraft

56. Present Soviet capabilities for air attack on the continental US are restricted by the small numbers of operational heavy bombers, by the limited capacity of base facilities in forward areas, and probably by the lack of an operational inflight refueling capability. Forward base capacities will continue to limit the total number of aircraft which could be launched against the US at one time, but as the number of BISON and BEARS increases, less reliance will have to be placed on forward bases for launching intercontinental attacks. Improved crew proficiency, development of an operational inflight refueling capability, and extensive improvement of the forward staging areas would result in a substantial increase in Soviet capabilities for attack on the US by mid-1959, even though the increase in the number of BISON and BEAR heavy bombers were less than estimated herein.

57. During the early part of the period of this estimate, the BULL and the BADGER would be the principal aircraft available for intercontinental attacks. We estimate that, however, as increasing numbers of newer types become available, the BULL will be phased out of long-range bomber units. In the latter part of the period the USSR would almost certainly place chief reliance on the BISON and the BEAR for intercontinental attacks on the US, with an improved BADGER playing a significant role primarily in shorter-range missions.

58. Without inflight refueling the BULL (see maps 1–4) would be unable to reach targets in the US on two-way missions even from forward bases unless it were modified,[10] in which case it could reach the Seattle area.

[9] For range coverage, see maps, Annex B.

[10] E. g., stripped and altered for longer range in a manner similar to the US B 29B.



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The modified BULL could, without inflight refueling, reach all of the US on a one-way mission from Chukotski. The current BADGER would require inflight refueling in order to cover most of the important target areas in the US, even on one-way missions from forward bases, but an improved BADGER (see maps 5–8), which we estimate will be available in 1957, will probably have adequate range to carry out these one-way missions without inflight refueling. In order to reach all targets in the US with the BISON (see maps 9–12, 17–18), the USSR would have to employ one-way missions. On two-way missions from forward bases and without inflight refueling, the BISON could reach only the northwestern quarter of the US. However, the BEAR (see maps 13–16, 19–20), if launched from the Chukotski Peninsula, could reach almost all of the US on two-way unrefueled missions; from the Kola area it could reach only the northern half of the US. Other significant range capabilities under varying conditions are as noted on the maps.

59. *Base Areas.* At the beginning of the period the entire Soviet long-range bomber force could be launched against the US only if bases in the Baltic-East German area were used in addition to those within the USSR. This area is not a likely choice for initial strike operations against the US, because direct routes to the US would involve overflight of Western territory with consequent loss of surprise, and because of the greater likelihood that preattack preparations would be detected. Except for heavy bombers, and possibly modified BULLS on one-way missions, bases in the Leningrad area are unlikely to be used for initial strikes because of the problems involved in either overflying or by-passing Scandinavia. If overflight of the Scandinavian area were to be avoided on an attempted strike against the US, a dog-leg over the Kola Peninsula of about 600–750 n.m. would be necessary. Therefore, the bases believed to be likely Soviet choices for mounting initial attacks on the United States at the beginning of the period are those in Kola, Chukotski, and Kamchatka. However, after an initial surprise intercontinental strike, all base areas could be used for reattack. Bases in the Central Arctic area might also be used for initial attacks despite unfavorable weather conditions and difficult logistical problems.

60. By mid-1959, the capacity of the bases in the Kola, Chukotski, Kamchatka, Central Arctic, and Leningrad areas could have been increased so that these bases could be used to launch simultaneously the entire long-range bomber force.

61. *Staging.* About a 10-hour flight would be required to move BULL aircraft from Far East home bases to Chukotski area bases, and about three to five hours from Western USSR bases to the Kola Peninsula. Flying times for BADGER and BISON aircraft would be about half as long. We have almost no evidence on the current status of servicing and fuel storage and transfer facilities at the forward bases. However, the USSR is fully capable of developing these facilities, if they are not already available. For example, we believe the USSR has a fuel truck with a capacity of 6,000 gallons and a pumping rate of 240 gallons per minute. We estimate that, when BISON and BEAR bombers appear in service in large numbers, the USSR will have available refueling equipment more compatible with the requirements of these aircraft. In order to service large numbers of long-range bomber aircraft at staging bases in forward areas, it would probably be necessary to increase present stocks of POL and servicing equipment and to establish or increase weapons stockpiles at these bases.

62. *Weather.* Weather and climatic conditions in the far northern staging areas would have a considerable impact on the timing and magnitude of attacks on the US. During cold weather, requirements for high-speed refueling and heated hangar space are among the critical problems which would be magnified as numbers and size of aircraft increased. Moreover, the coordinated launching of a large-scale attack composed of elements from widely separated base areas would probably be further complicated by varying weather conditions at the different bases. Cold weather problems would, however, be less critical with jet than with piston aircraft.



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63. The USSR has demonstrated that it can effectively operate aircraft under extreme cold weather conditions. In addition, aircraft performance is improved by low ground temperatures in Arctic areas where the higher density of cold air increases engine thrust and increases airfoil lift so that take-off distance may be reduced or maximum gross take-off weights increased. For example, at 0° F. the ground run requirement for take-off of jet bombers would be about 25 percent less than under standard conditions (see paragraph 25). Ground run requirements for the BULL would also be reduced but the difference would not be as great as for jet bombers.

64. The low temperatures of the Arctic region also pose some special problems in the handling of nuclear weapons. However, virtually all of the components of nuclear weapons are better able to resist the effects of cold weather than are the delivery aircraft, and provision of adequate shelters and equipment to overcome the undesirable effects of cold weather on the bombs is a much simpler problem. We estimate that the USSR can successfully store and assemble nuclear weapons for use at Arctic bases under any weather conditions which will permit the operation of bombers. The problem of storage could also be largely eliminated by storing the bombs in rear areas and moving them to the advanced bases as needed, although such an operation would introduce additional timing problems.

65. *Scale of Prestrike Preparations.* At present the preparations necessary for launching a maximum-scale attack from likely staging areas would probably require several months after their initiation. By mid-1959, however, only minimum preparation would be required, provided that during the interim a major effort had been made to improve base facilities and training, logistics, and equipment of the Long-Range Air Force.

66. *Assumptions Underlying Estimated Intercontinental Striking Forces.* Within the limits of base capacity, aircraft performance, and operating conditions, the size of the strike force which the USSR could launch would vary with the employment of different types of aircraft. The variety in methods of employment and attack patterns open to the USSR makes it difficult to estimate which airfields the Soviet Union might employ in an initial surprise attack. Moreover, on many forward airfields, we lack sufficient intelligence to make firm estimates of their capacities to stage bomber aircraft.

67. In order to determine the general order of magnitude of Soviet capabilities for an initial attack against the US, we have considered the available intelligence on runway lengths, POL, maintenance, other base facilities and accessibility for supply purposes, and have arrived at an estimate of a probable maximum capacity of each of the forward bases for staging bomber aircraft. All bases that we have selected for the staging of heavy bombers have runway lengths of at least 7,500 feet and are considered to have an average maximum staging capacity of 30 heavy or 60 medium bombers. Those selected for staging medium bombers only have generally fewer base facilities, but have runways estimated to be at least 5,200 feet in length. Their maximum staging capacities are considered as varying from 20 to 60 medium bombers, depending on the facilities at each base. Although usable on the basis of estimated aircraft performance figures, existing runways at many of these airfields are considerably below the standards normally associated with Soviet long-range bomber bases, and their use in 1956 would require the acceptance of reduced safety margins.

68. The following planning factors, based largely on US experience, have been assumed:

*a.* 90 percent of aircraft at home base in commission after stand-down;

*b.* 85 percent of those aircraft departing home bases can be launched from staging bases (includes attrition enroute to and while at staging bases);

*c.* 80 percent of these bomber aircraft launched on unrefueled missions will arrive in target area (excluding combat attrition);

*d.* 75 percent of those bomber aircraft launched on missions utilizing inflight refueling will arrive in target areas (excluding combat attrition); and



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*e.* An allowance of 1.2 tanker aircraft provided for each bomber refueled in flight (compatible [11] tanker assumed).

69. *Estimated Strike Forces in 1956.* We estimate the USSR could, from its present forward bases, augmented by the three home bases in the Leningrad area, mount an initial strike of approximately the following size: 700 bombers on base, 600 could be launched, and as many as 500 could arrive in the target area. If tankers were available and used from these bases, the bomber force would have to be reduced accordingly. (See Annexes A and E for an estimate of staging capacities of individual bases in each area.)

70. If the USSR elected to utilize all available bases, including some in the Baltic-East German and Leningrad areas, and thus lessen its chances of achieving surprise, it could initially launch the maximum number of aircraft which would be serviceable (approximately 900) against the US in 1956. Not considering combat losses, approximately 720 might reach target areas.

71. *Estimated Strike Forces in Mid-1959.* By mid-1959, the capacity of the forward staging areas and Leningrad could be increased to permit the entire Soviet long-range bomber force to be launched from these areas in an initial attack. We have also estimated that by mid-1959 the USSR would have some 400 BISON and 300 BEAR aircraft in operational use. Moreover, the USSR could have a substantial inflight refueling capability and a number of heavy bombers could thus be launched from interior bases in initial attacks on two-way missions. In this case the Leningrad base area could be used for some of the heavy bombers making initial unrefueled attacks on the US. Under these circumstances, the mid-1959 Soviet strike capability could be as follows:

| | On Base | Launched | Arriving in Target Area |
|---|---|---|---|
| BADGER | 330 | 280 | 225 |
| BISON | 360 | 310 | 235 |
| BEAR | 270 | 225 | 180 |
| Tanker | 360 | 300 | ... |
| Totals | 1,320 | 1,115 | 640 |

We have assumed the following method of employment:

| | 2-way Unrefueled | 2-way Refueled | 1-way Unrefueled | Totals |
|---|---|---|---|---|
| BADGER | .. | .. | 280 | 280 |
| BISON | 50 | 260 | .. | 310 |
| BEAR | 225 | .. | .. | 225 |
| | 275 | 260 | 280 | 815 |

72. Should the USSR elect to use only heavy bombers in an initial strike against the US, about 630 could be launched if home bases were utilized as launching bases. About 500 could arrive in the target area, not considering combat losses. If bombers staged through forward bases, the number launched and the number arriving in the target area would be about 530 and 420, respectively.

73. *Allocation to ECM and Diversionary Tasks.* It is important to note that a significant proportion of the above strike aircraft would probably be used solely for ECM and diversionary tasks.

## Naval Attack Capabilities Against the US

74. Although there is no firm evidence that the USSR has developed a submarine-launched guided missile capability, such a capability would constitute a significant threat against US targets and could be used to supplement aircraft strikes. By this means the USSR could attack important US military, economic, and population centers along both seaboards and inland within range.

75. In view of current indications of an extremely active Soviet long-range submarine building program, and the considerable capabilities that submarine-launched missiles would provide for hitting vital US targets, submarine-launched guided missiles might be an important supplement to nuclear attacks

[11] As used in this estimate, "compatible" means having characteristics of speed and altitude suitable to the bomber employed, and a transfer capability sufficient to add 35 percent to the range of the bomber.



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by aircraft in any Soviet attack plan. This would be more likely by 1959, when such missiles could have not only nuclear warhead yields consonant with their CEP's but also increased range and reliability. However, no firm estimate as to the probable magnitude of such submarine-launched guided missile attacks can be made at this time. The actual scale of such attack would depend not only upon the availability of missiles and of specially configured submarines, but also upon the Soviet requirement for submarines in their conventional role. Soviet judgment as to the risk of forfeiting the element of surprise would also be involved. The chances for such forfeiture would mount as the numbers of submarines to be deployed prior to initial attacks was increased. Such considerations suggest that the actual force involved would be only a small portion of the total submarines available now and in 1959.

76. The capabilities of Soviet surface naval forces for attacks on the US are very low. Sporadic raider operations are possible, but the surface fleet in general, lacking aircraft carriers, is unsuitable for transoceanic naval operations on any significant scale.

## Clandestine Methods of Attack Against the US

77. *Clandestine Delivery of Nuclear Weapons.* We have no evidence as to any Soviet plans or preparations for clandestine delivery of nuclear weapons against the US. However, during the period of this estimate the USSR will be capable of producing nuclear weapons which could be smuggled into the US either as complete assemblies or as component parts of subassemblies. These could range from small-yield weapons (five kilotons or less), weighing a few hundred pounds and small enough to fit into the luggage compartment of an automobile, up to the highest-yield device the USSR was capable of producing (10 megatons or more). All of these weapons or devices could be designed to break down into a number of relatively simple and readily transportable components. Those designed to give a relatively low yield would not require much labor or technical training for assembly. Somewhat more labor and training would be required to assemble weapons designed to give high yields, and, once assembled, they would be more difficult to transport. The size and weight of any multimegaton device would be such that it could probably be used only as a fixed installation in the hold of a merchant vessel or in secure premises, such as the Soviet embassy.

78. Considering the known limitations of the means of physical detection, the USSR could probably introduce into the US and detonate in place a considerable number of nuclear weapons by clandestine means. A variety of methods of clandestine delivery suggest themselves. Assembled weapons could be dropped by apparently friendly aircraft, detonated in the hold of a merchant ship, or sown as underwater mines by submarines and possibly by merchant ships. Either components or assembled weapons could be brought in under diplomatic immunity, smuggled across land or sea frontiers, introduced through normal import channels, or brought in as bonded merchandise awaiting transshipment.

79. In introducing nuclear weapons clandestinely into the US, the USSR would have to take into account not only the estimated chances of detection, but also the consequences of detection, including the loss of surprise in any intended overt attack and the possible provocation of US military action. As the number of weapons clandestinely introduced was increased, the risk of compromise would grow. This increased risk would be less a function of the physical means of detection (the effectiveness of which is extremely limited) than of the possibility of US penetration of the Communist apparatus, or of the defection of even a trusted agent, or of sheer accident. The USSR could not be confident that none of these mischances would occur. We conclude that, although clandestine attack with nuclear weapons might be made against specially selected targets, as a supplement to overt delivery by air, the use of large numbers of such weapons would probably be precluded by security considerations.

80. *Clandestine Use of BW and CW Weapons.* Most biological warfare (BW) agents are peculiarly adaptable to clandestine utilization,



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since detection of their intended use would be difficult. Even small-scale employment of BW agents against livestock could be highly effective. BW attacks against personnel concentrated in selected buildings could also be effective. Anticrop BW operations could be carried out clandestinely, with possible damaging effects under proper environmental conditions.

81. CW agents are not as suitable to clandestine operations as BW agents. The effects are more readily identifiable and except on a limited scale, a much greater effort would be necessary to deliver quantities required for lethal concentrations. Although it probably would not be feasible to accumulate CW agents or dissemination devices for more than limited attacks against population centers in the US, CW attacks against personnel in buildings could be effective.

82. *Subversion, Espionage, Sabotage.* The USSR is capable of subversion, espionage, and widespread sabotage in the US through the use of existing subversive elements and the placement of foreign agents. Sabotage probably would not be initiated on a large scale prior to an all-out attack on the US since these efforts would nullify the advantage of surprise, if identifiable with the USSR. Attempts to sabotage US transportation, industrial and communications facilities, and military installations could be expected with and immediately following surprise attack by the USSR. Communist party members and adherents are capable of organizing saboteur units of varying sizes equipped with small arms and other suitable material which could strike at especially selected and widely separated targets simultaneously and without warning. Whether these attacks would be timed with a surprise military attack or carried out after attack would be dependent upon the Soviet appraisal of the relative advantages of such action.

## VII. CAPABILITIES TO ATTACK US OVERSEAS INSTALLATIONS AND FORCES

### Attacks by Aircraft

83. Assuming the USSR launched attacks against the US on the scales indicated in paragraphs 69 and 71, there would remain in its operational establishment about the following numbers of long-range bombers:

| | At Present | Mid-1959 |
|---|---|---|
| BULL | 250 | 0 |
| BADGER | 50 | 330 |
| BISON | 0 | 0 |
| BEAR | 0 | 0 |
| | 300 | 330 |

These aircraft would be subject to the attrition factors set forth in paragraph 68. In addition, an indeterminate number of reparable planes and salvaged aborts from the aircraft committed to the intercontinental attack would also be available for later employment.

84. From bases in the USSR, the BULL, if modified, and the improved BADGER, on two-way missions carrying a 3,500 lb. bomb load, could reach key US installations in the UK, Western Europe, Iceland, Greenland, the Azores, French North Africa, Libya, the Middle East, Japan, Okinawa, Alaska, Guam, and the Philippines. To reach key installations beyond these areas, they would have to resort to inflight refueling or one-way missions. Jet heavy bombers on two-way missions from bases in the USSR could reach all the above areas and, in addition, Hawaii, Labrador, and Newfoundland. The BEAR, from interior bases, and the BISON, from forward bases, would be able to reach the Panama Canal but only on one-way missions. (See map 21.)

85. The USSR's estimated 2,900 jet light bombers (3,100 in 1959) could also be used for attacks against the many key US installations and forces overseas within their operational radius. There is an adequate number of Bloc fields suitable for jet light bombers within range of key US overseas installations and forces. From bases in East Germany, jet light bombers on two-way missions could reach the entire North Sea area, the UK and its northern and western approaches (including the Faroes), France and its western approaches, and northeastern Spain. From bases in Hungary, Bulgaria, and Rumania these aircraft could reach most of the Mediterranean Sea. From the southern USSR, they



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could reach the area north of an arc Crete-Israel-Kuwait. Jet light bombers based in the Vladivostok and Dairen areas could reach all of Japan. To reach Okinawa and Luzon on two-way missions, they would have to stage from bases in Communist China. (See map 21.) However, for maximum effectiveness of attacks by light bombers against the more distant targets, considerable redeployment from present base areas to forward bases would be required.

## Attacks by Guided Missiles

86. *Ground-Launched Missiles.* The 350 n.m. ballistic missile which we estimate the USSR could now have, and the 850–900 n.m. missile which could begin to be available in 1955–1956, could be used against US overseas installations and forces. From forward Bloc areas such missiles could reach most US overseas installations, including bases in the UK, Spain, Japan, and Alaska. However, the small number probably available and their performance limitations would seriously limit Soviet operational capabilities in this field during the early part of the period.

87. However, Soviet ground-launched missile capabilities probably will increase markedly as a result both of the greater numbers of these weapons available and their improved performance and reliability. In 1958–1959, the USSR could also have ready for series production an IRBM with a range of about 1,600 n.m. Large-yield nuclear warheads for ballistic missiles would probably be available in 1959–1960. With the IRBM the USSR could attack most of the more distant US overseas targets, while simultaneously using short- and medium-range missiles against less distant targets. (See map 22.) These missiles could therefore constitute in 1959 a significant threat to US overseas installations and forces, largely because of the probable invulnerability of ballistic missiles to countermeasures.

88. *Submarine-Launched Missiles.* Submarine-launched guided missiles might be used against selected targets to supplement aircraft and ground-launched missile attacks. The range estimated for Soviet submarine-launched missiles (see paragraph 43) would permit them to reach many key overseas installations. These missiles could also be used against carrier and other naval forces in port or as weapons of opportunity at sea.

## Attacks by Conventional Forces

89. *Ground Attack.* The decision as to how and when to use Bloc ground capabilities would probably be strongly influenced by the desire to obtain strategic surprise, a consideration which weighs heavily against their employment prior to the time initial air attacks were detected. Ground attacks supported by tactical air and naval forces would almost certainly be an integral part of the over-all Soviet campaigns on the Eurasian land mass, and would present a threat to overseas installations and forces in operations immediately following initial attacks.

90. *Airborne Attack.* Soviet airborne and amphibious operations might be conducted in several areas in order to achieve early destruction of US overseas forces and installations. The capability of these forces to seize and destroy key installations and to assist in the destruction of US forces would be substantial in certain areas including Alaska. Soviet airborne capability is limited by the availability of transport aircraft. It is estimated that Soviet Aviation of Airborne Troops can lift 9,000 troops with one drop on D–day, or 14,000 with two drops, to a maximum distance of 500 n.m. For a five-day operation approximately 23,000 to 25,000 troops could be lifted. By 1959, it is estimated the USSR will be able to lift 11,000 troops on D–day and 29,000 over a five-day period. The lift capability in both periods could be increased by about 1,800 troops for every 100 aircraft made available from the 3,000 transport aircraft of the civil air fleet and other components of military aviation. If the USSR converted BULL aircraft for transport purposes, the Soviet capability to transport troops by air could be increased by about 5,000–6,000 troops per 100 aircraft converted.

91. *Amphibious Attack.* Because of the lack of aircraft carriers and vessel types suitable for amphibious warfare, large-scale Soviet amphibious attacks would be limited to short-



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range operations in areas where air cover could be provided from Communist-controlled territory. However, amphibious raids by submarine-borne forces to attempt destruction or neutralization of key US overseas installations are possible. Amphibious assault against the continental US (except Alaska) is beyond Soviet capabilities. In assaults against Alaska, certain restrictions would be imposed by: (a) the limited number of landing beaches; (b) climatic conditions; (c) problems of establishing and maintaining lines of communications; (d) the difficulties of maintaining adequate logistic support; (e) the limited amphibious capability of the Far Eastern Fleet; and (f) the difficulties of maintaining adequate air cover. Amphibious attacks against other key US overseas installations, except in the Far East, would probably be limited to amphibious raids by submarine-borne forces. Amphibious operations with an initial assault force of up to three divisions, and a follow-up force of five to six divisions, could be launched against Japan. This lift capability could be employed in other areas of the Far East within range of Soviet land-based support aircraft.

92. *Naval Forces.* We estimate that, in a maximum initial effort, as many as 220 of the long and medium range submarines located in the Baltic-Northern Fleet and Pacific Fleet areas — 160 and 60 respectively — could be made available for attacks against US naval forces and sea communications, and key installations overseas. By mid-1959, these numbers could be increased to about 420 and 100 respectively. A portion of these submarines would almost certainly be employed against US naval forces, and especially to prevent attacks by carrier striking forces with a nuclear delivery capability. In addition, Soviet submarines would almost certainly be employed against US sea communications by attacks on shipping and by mining the approaches to harbors and ports. Many of these could be concentrated, as opportune, against US naval task forces.

93. Soviet surface naval forces have a low capability for contesting control of the high seas. The Soviet surface fleet lacks advanced bases and does not possess a shipborne air arm, but these forces could be effectively employed within the radius of shore-based air cover.

## Clandestine Attack Capabilities

94. *Subversion, Espionage, Sabotage.* Soviet capabilities for subversion, espionage, and widespread sabotage attacks against key overseas bases are greater than against the continental US because of the much larger proportion of Communist elements, widespread political discontent, and lack of adequate security measures in certain foreign nations. Communists in some of these countries are experienced in such operations, and sabotage efforts timed with large-scale military attacks could materially reduce the capability of US military forces overseas.

95. *Clandestine Delivery of Mass Destruction Weapons.* Considerations influencing the use of clandestine methods of delivery of mass destruction weapons by the USSR against overseas targets will in large part be similar to those discussed above in paragraphs 78–80. However, because of generally greater subversion capabilities and of geographic propinquity, Soviet capability for using these methods overseas, while limited, is greater than against the US.



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# ANNEX A

## BASE AREAS SUITABLE FOR LONG-RANGE BOMBER OPERATIONS

1. *Chukotski Peninsula.* As the result of runway construction believed to have been carried out at several airfields within the past two years, we believe that at least six airfields probably now have runways adequate for staging medium bombers and that at least two of these are suitable for heavy bomber operations. Military air units are based on some of these airfields but none are subordinate to Long-Range Aviation.

2. Air operations in this area are made difficult by several factors. Recent construction of long, surfaced runways indicates that climatic and logistical difficulties of this area are being overcome. However, ice and compacted snow runways are also still in use. The lack of modern navigational aids hampers operations, but there are some indications that the USSR is steadily improving its operational potential through installation of modern radio navigation facilities. In addition, the USSR has an ever-increasing fund of Arctic experience which can be applied to staging operations in this area.

3. Cold, wind, snow, and fog, which are prevalent throughout the area, tend to make operations difficult and hazardous. The most unfavorable weather conditions occur during November through March.[1] The most favorable conditions occur at all stations during the spring and early summer. Weather in the interior is highly favorable during the summer months. Only those areas adjacent to the Chuckchee Sea or which lie along the Bering Sea coast have a relatively high incidence of unfavorable conditions during the midsummer months.

4. The status of base logistical support facilities required to stage long-range strike operations from the Chukotski area is unknown. The area is accessible only by air and by sea during the ice-free season, and supply problems would be difficult. However, the USSR is considered capable of stockpiling the necessary supplies. Moreover, the area's staging potential could be markedly increased by 1959. By using construction elements already available in the area the USSR could build two additional concrete surfaced runways, 6,000 to 8,000 feet in length, by 1959.

5. *Kola Peninsula.* The Kola Peninsula has at least six bases believed adequate for staging operations of medium bombers at maximum gross weights, provided that a reduced safety margin on take-off was accepted for the BULL. One other airfield is considered to be suitable for use on an emergency basis, but its extremely isolated location, plus its apparent lack of recent development or use, argue against its use as a staging base. At least one of these airfields would be adequate for heavy bombers at maximum take-off weights, provided reduced safety margins were accepted. Permanent-surfaced runways can be constructed throughout the area without difficulty as it is relatively free of permafrost.

6. Prevailing climatic conditions, while a restrictive factor on air operations, are relatively more favorable than in other regions of the Soviet Far North. In general, the most favorable conditions occur in the late spring and early summer. In late summer and early autumn, conditions are favorable except at bases adjacent to the cold waters of the White Sea. However, during May through October conditions are favorable at all locations over

[1] In order to estimate the seasonal suitability of average weather conditions in potential staging areas, the percentage frequency of occurrence of those conditions which would handicap the mass movement of aircraft into or out of staging areas was computed. Two conditions were selected as a basis for analysis: (1) ceiling/visibility less than 300 feet/1 mile; (2) temperature below −20° F., although with adequate preparations staging operations could be carried out successfully in temperatures below −20° F.



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90 percent of the time. In winter, conditions are less favorable due to the more frequent occurrence of low ceilings and poor visibilities. Extremely cold temperatures are relatively infrequent, and occur less than 10 percent of the time at any base.

7. The status of base logistical support facilities required to conduct long-range bomber strikes from airfields in this area is unknown, but it is considered that logistics would not be an important limiting factor. Supply routes by rail and road are open to the Kola Peninsula on a year-round basis, although logistical support of large-scale air operations would still pose difficulties under extreme weather conditions. Moreover, the staging potential of the area could be readily increased. No additional construction capability would be required in order to build three additional concrete-surfaced runways 6,000 to 8,000 feet in length by 1959.

8. *Central Arctic.* An airfield construction and development program in this area has been in progress since early 1949. Five airfields are known and others probably exist. The development program was carried out for the Directorate of Polar Aviation of the Northern Sea Route Administration, but at least some of the airfields built probably have runways of sufficient length to handle the staging of medium bombers under conditions of reduced take-off weights and/or reduced safety margins. In addition, there is one field suitable for the staging of heavy bombers. However, logistical support would be difficult, probably requiring heavy stockpiling.

9. This area has by far the most unfavorable weather of all the areas considered. The major handicap to air operations arises from the frequency and persistence of extremely low temperatures. For example, at Tiksi over 50 percent of all observations during January record temperatures lower than −20° F. Jet engines, however, are less adversely affected by low temperatures than piston engines and jet take-off requirements are considerably reduced. Even the summer months are not very favorable due to the high frequency of fog in the coastal belt.

10. *Leningrad.* This area contains at least three home bases of Long-Range Aviation units equipped with BULL aircraft. These bases probably have runways of sufficient length for heavy jet bomber operations under conditions of reduced take-off weights and/or reduced safety margins. The Long-Range Aviation basing potential of the area could be increased without difficulty by employing available airfield construction units to further improve existing airfields. Such development would require only a minimum of additional construction, as there are already 18 airfields within 200 nautical miles of Leningrad with concrete runways at least 6,000 feet in length, and seven other airfields with concrete runways in excess of 5,000 feet in length. None of these additional bases, however, are known to be associated currently with Long-Range Aviation operations. Operations from this area by long-range aircraft would offer the advantage of a temperate climate and good logistical support.

11. The bases in this area have the most favorable weather during the late spring and summer, when about 97 to 99 percent of the time is favorable for operations. Even during autumn and winter 88 to 90 percent of the weather is favorable at all bases. There appears to be little difference between night-time and daytime weather except during September, October, and November. During these months, reduced visibility sometimes occurs during the early morning hours. Temperatures below −20° F. occur less than five percent of the time at all bases.

12. *Kamchatka–Sea of Okhotsk Area.* Four airfields in this area have runways which would permit ground runs of at least 5,000 feet. One of these airfields is considered adequate for medium bombers at maximum gross weights, provided reduced safety margins were accepted for BULLS. The other three could be used by BULLS with considerably reduced take-off weights and by BADGERS at maximum gross weight, provided lower safety margins were accepted. For the above reasons long-range capabilities from this area are estimated to be extremely limited, but facilities could be developed to accommodate medium and heavy bomber operations by 1959.



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13. The weather in this area is relatively favorable for air operations. Throughout the year the weather on the east coast of Kamchatka Peninsula is the most favorable in the entire area. In the Magadan area the best weather occurs during the early spring and autumn.

14. *Baltic-East Germany.* Poland and the Soviet Zone of Germany have a total of at least 60 airfields from which medium and heavy bomber operations could be mounted against the US and US bases in Western Europe. However, a disadvantage of this area as a base for air attacks on North America is that Great Circle routes pass over nations friendly to the US. In addition, it would be more difficult than in other forward base areas to maintain security of preparations for attack. However, climatic conditions are most favorable and there would be relatively few logistical problems. This base complex is served adequately by all types of transportation.

15. The bases located in the Baltic coastal area are most suitable for air operations during April through August, when favorable conditions occur about 97 percent of the time, both day and night. The least favorable period is December through March, when frequency of favorable conditions drops to about 75 percent. However, the unfavorable conditions occur most often during the night and early morning hours. The midday hours are favorable for operations about 85 percent of the time. Very low temperatures are rare in this area.



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# ANNEX B: MAPS

## I. GENERAL

The following maps show estimated Soviet long-range aircraft and guided missile range/radius capabilities under selected conditions against key US and overseas targets through mid-1959. The maps depicting the capabilities of the BISON (nos. 9–12) and BADGER (nos. 5–8) are based on estimated performance characteristics of improved versions of these aircraft estimated to become available in mid-1956 and in 1957, respectively. The estimated capabilities of the current versions of these two aircraft types are shown in boxes included on the appropriate maps. The estimated capabilities of the modified BULL are shown in boxes on the maps dealing with the standard version of this aircraft (nos. 1–4).

Estimated range coverage under refueled conditions is particularly difficult to depict since many different routes and refuel points could be used by Soviet strike forces. Therefore, it should be noted that this coverage assumes certain routes and refuel points, and under different assumptions the indicated coverage would be somewhat altered.

## II. RANGE COMPUTATION

In all cases the estimated coverage is based on ranges calculated in accordance with US military mission profiles. For estimating ranges under *unrefueled* conditions it has been assumed that Great Circle routes would be flown, although such flights would have to transit major Western warning and defense positions. For *refueled* flights, however, routes indicated show possible approaches intended to avoid overflight of major Western defense and warning systems. Total ranges indicated assume a Soviet refueling capability permitting a range extension of approximately 35 percent.



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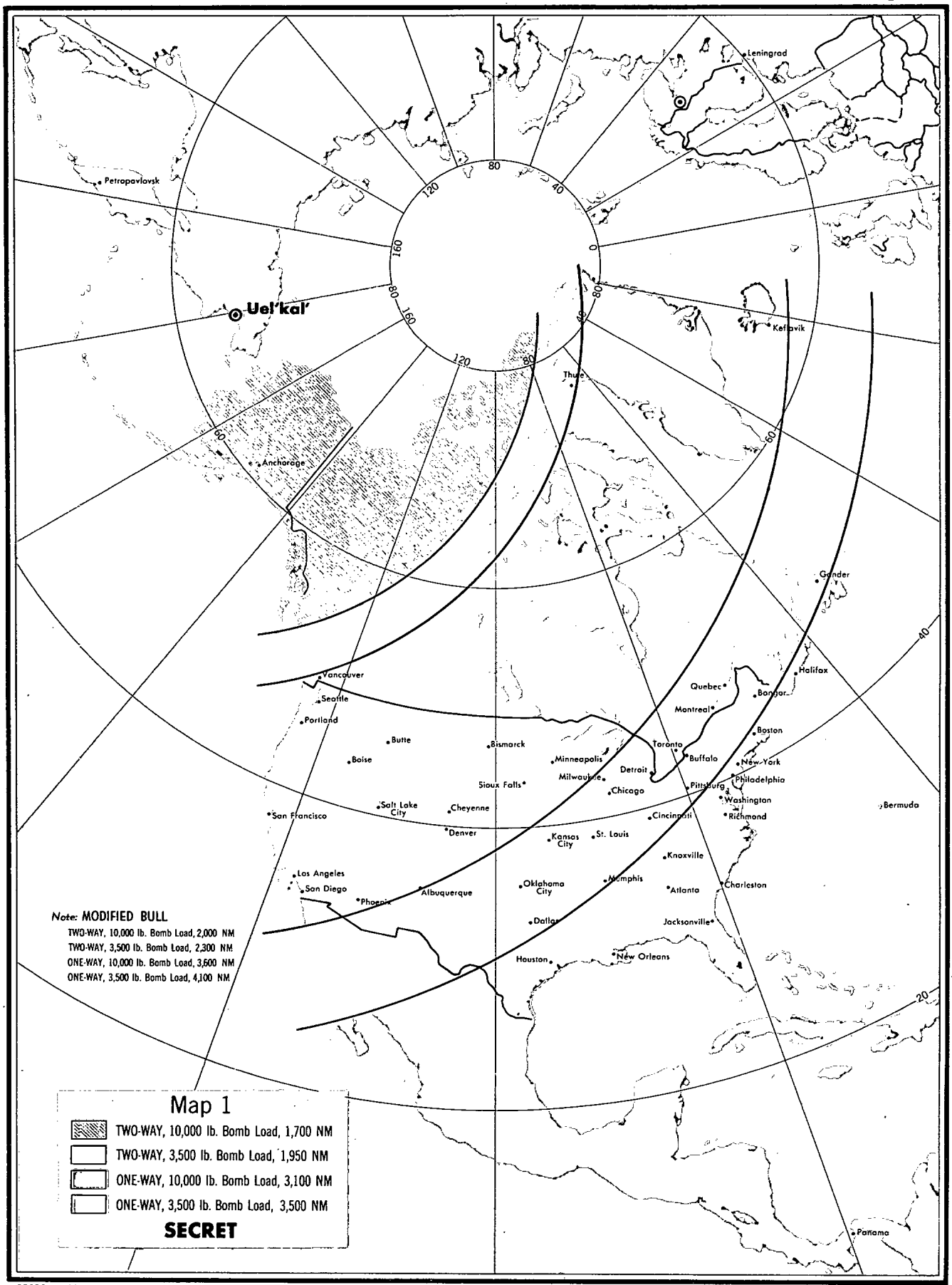
# RANGE OF STANDARD BULL, UNREFUELED

*From the Chukotski Area*

SECRET

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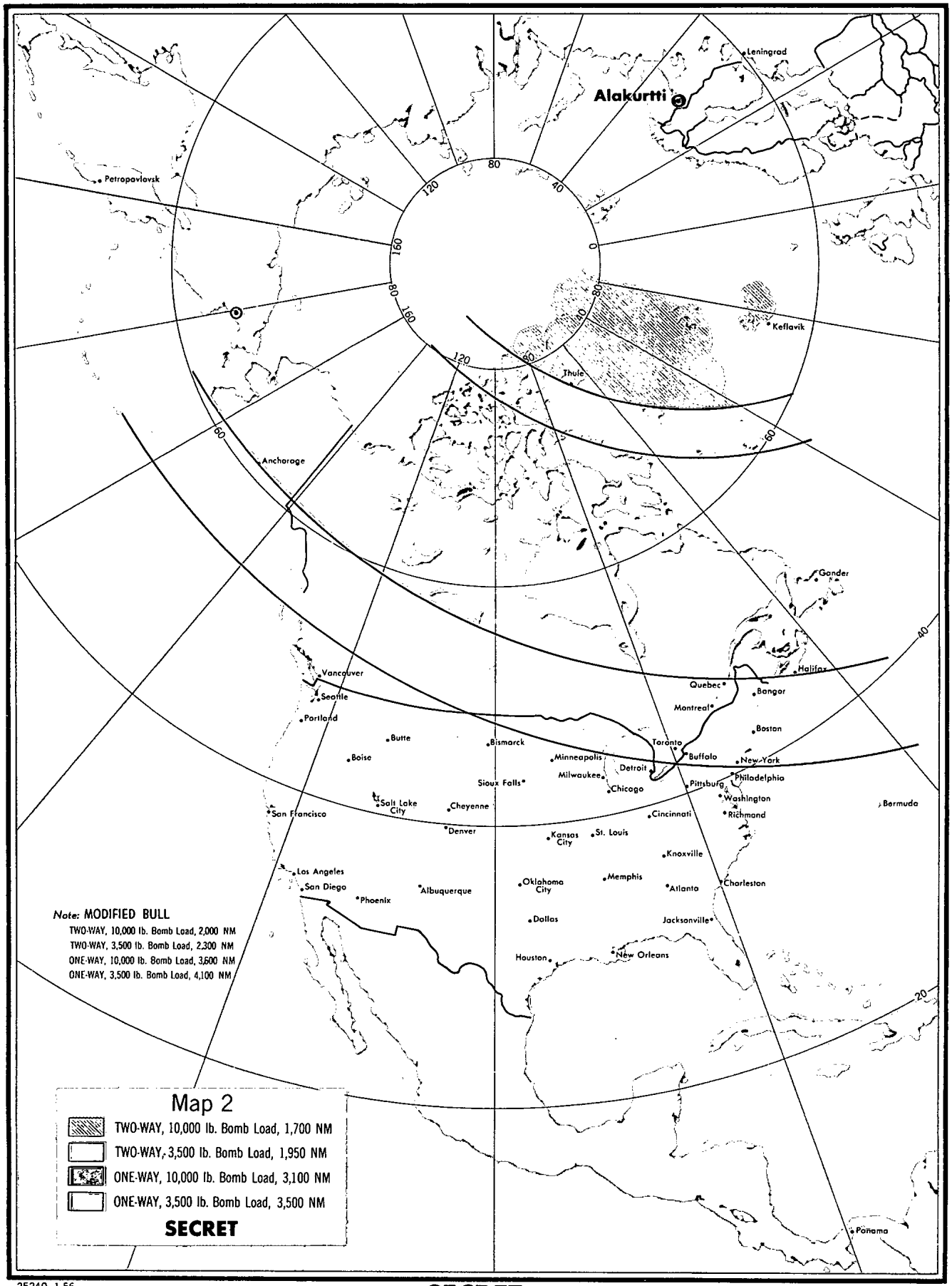
# IY OF STANDARD BULL, UNREFUELED

*From the Kola Area*

SECRET

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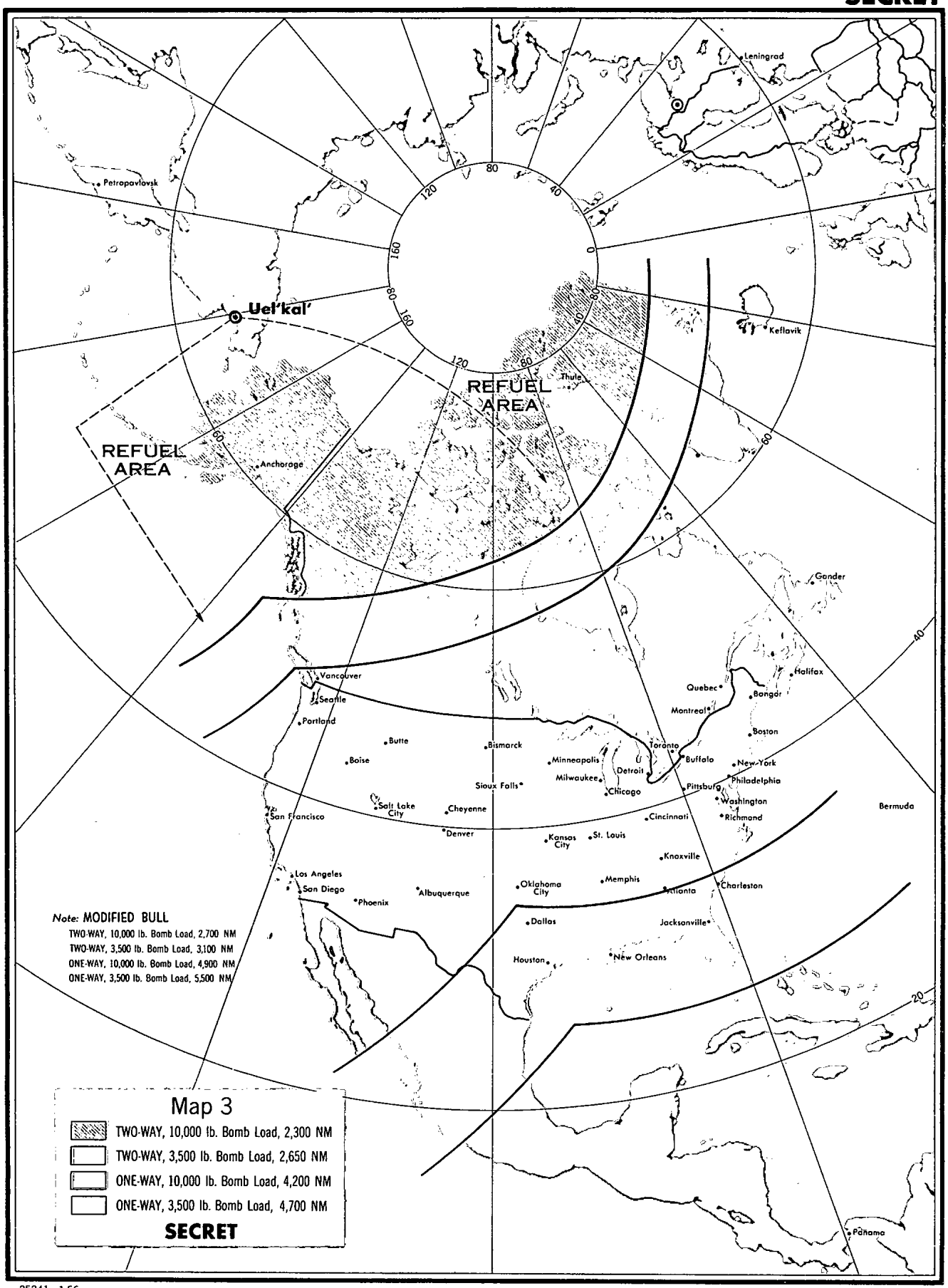
# CITY OF STANDARD BULL, REFUELED

*From the Chukotski Area*

**SECRET**

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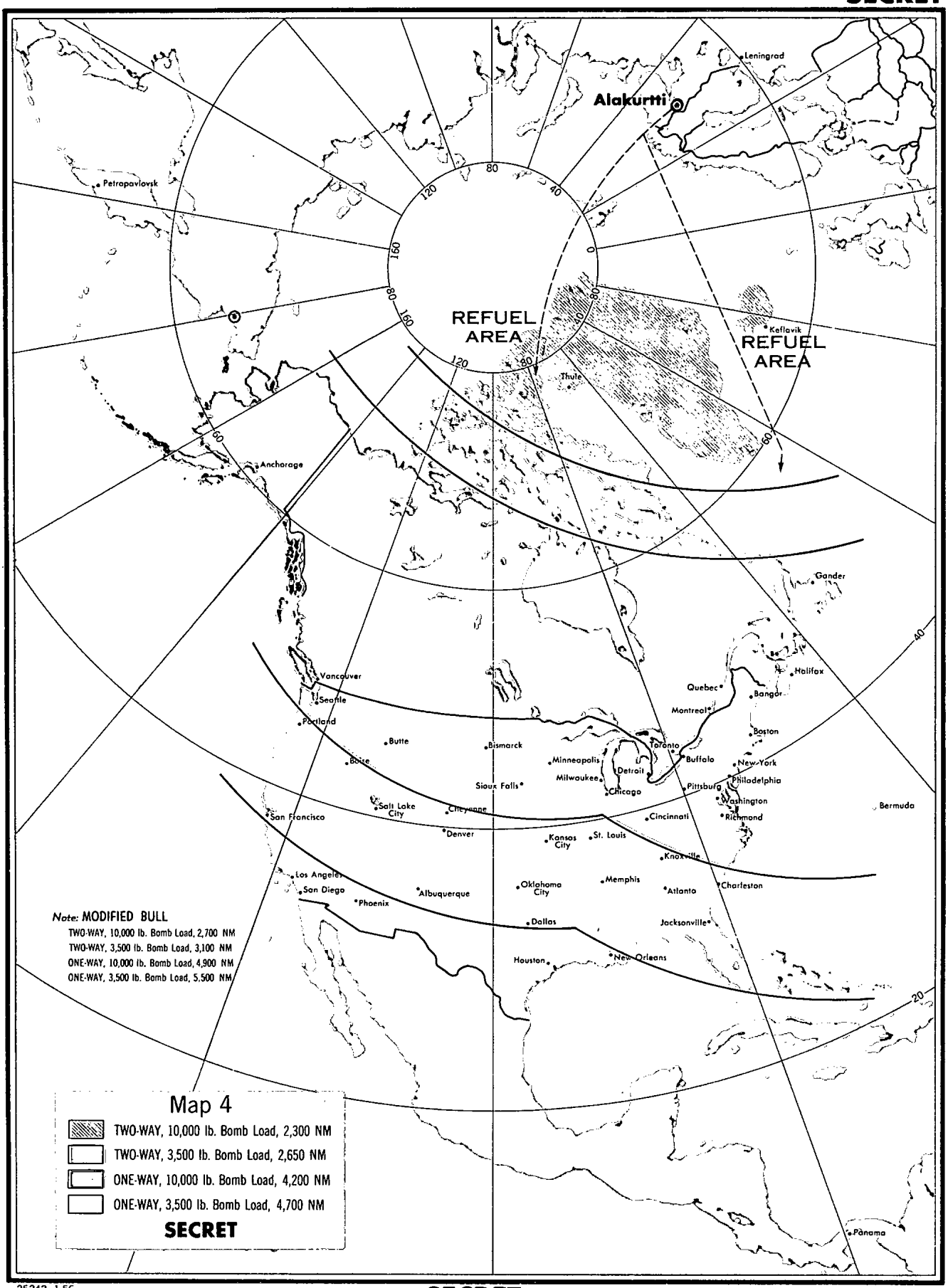
# CITY OF STANDARD BULL, REFUELED

*From the Kola Area*

SECRET

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# Y OF IMPROVED BADGER, UNREFUELED

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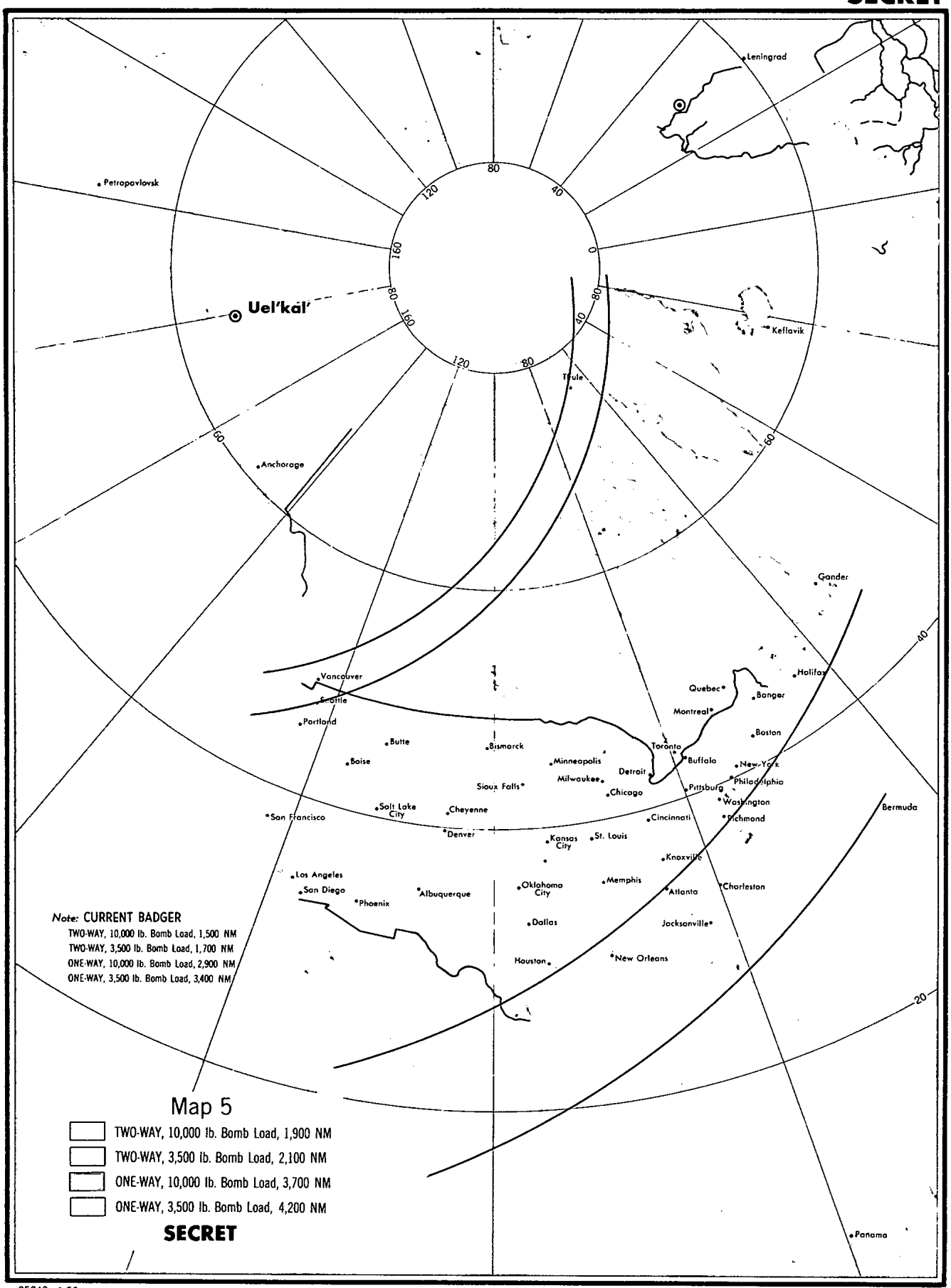


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# ITY OF IMPROVED BADGER, UNREFUELED

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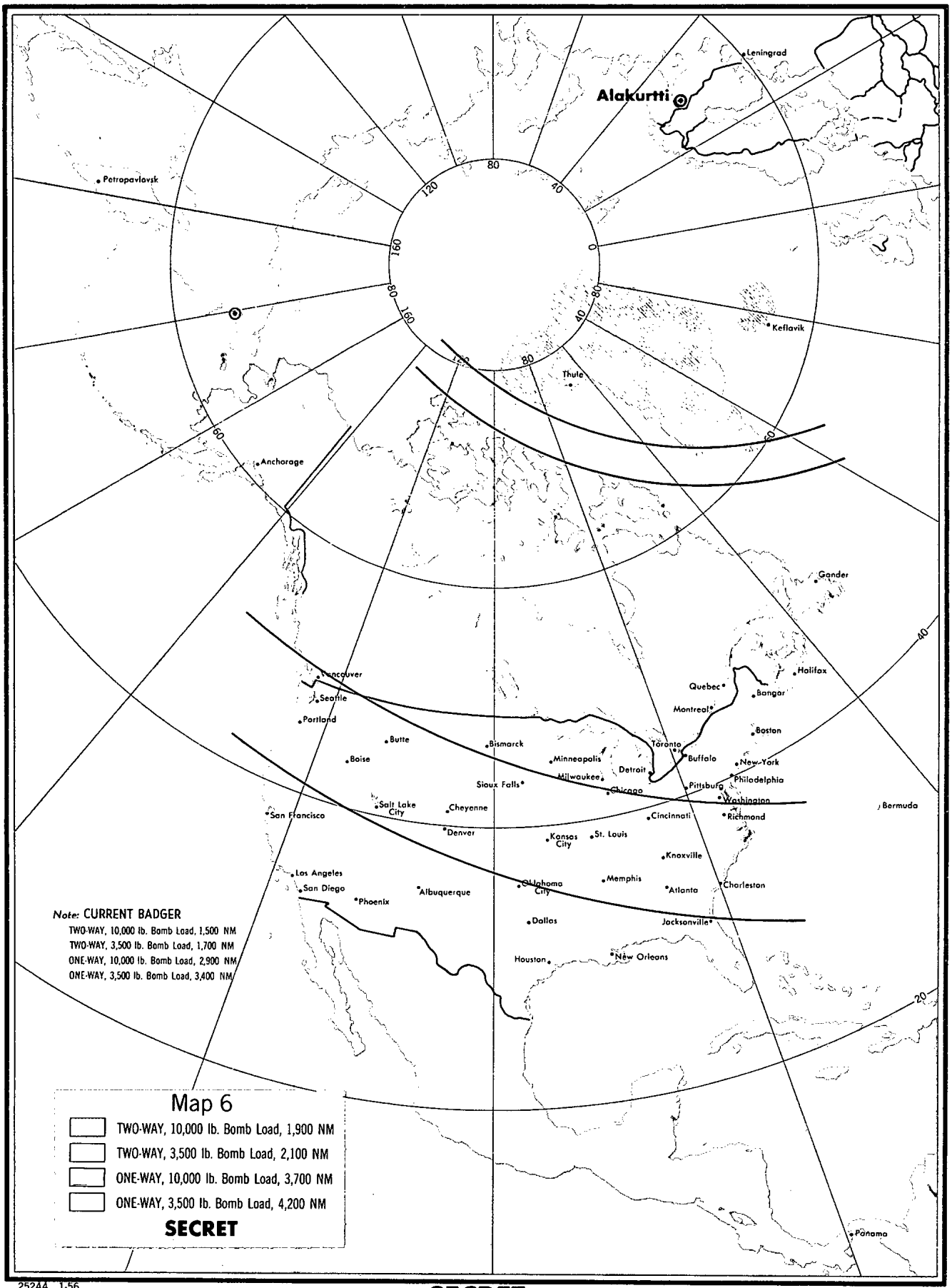


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# TY OF IMPROVED BADGER, REFUELED

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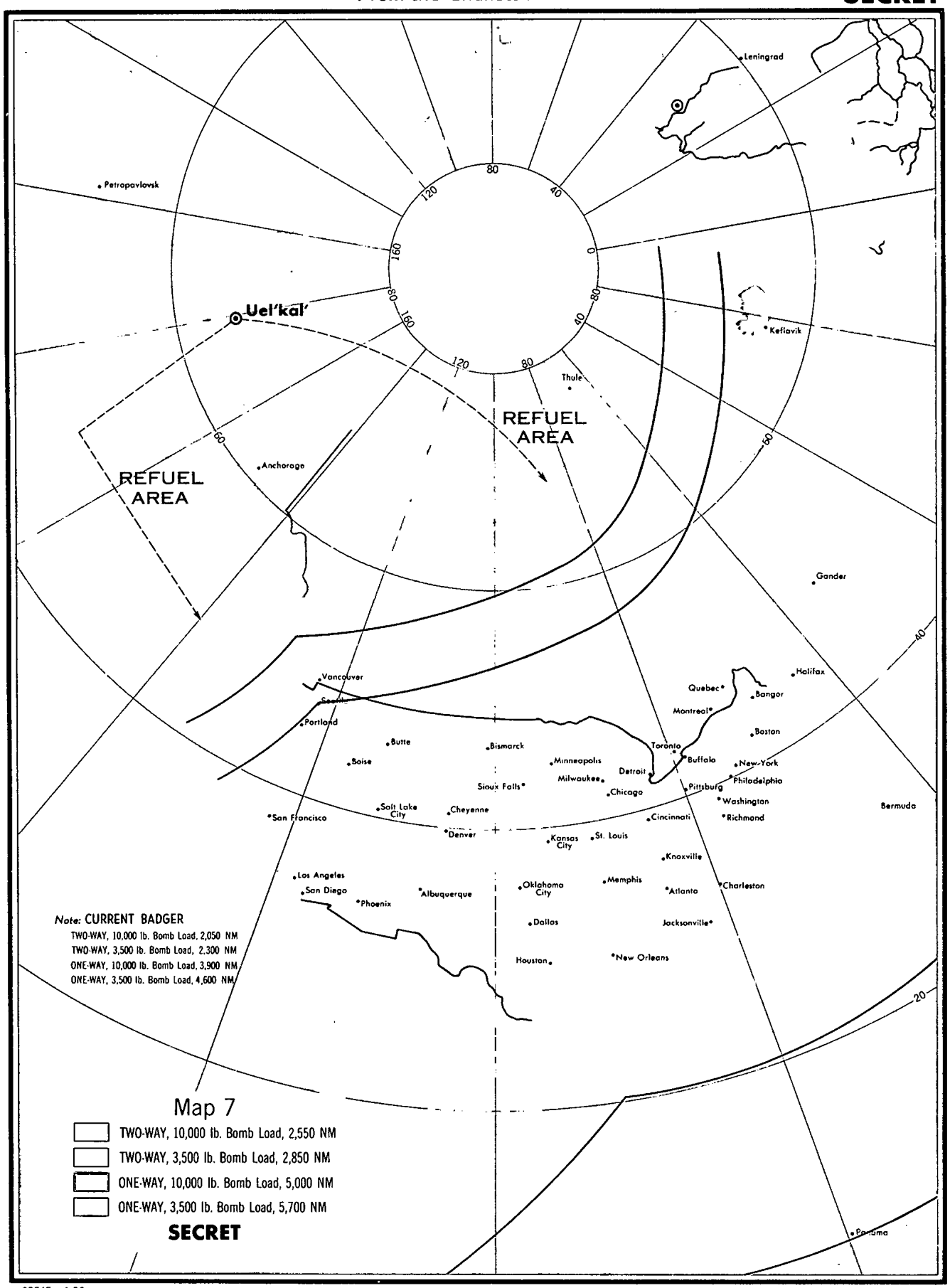


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# TY OF IMPROVED BADGER, REFUELED

*From the Kola Area*

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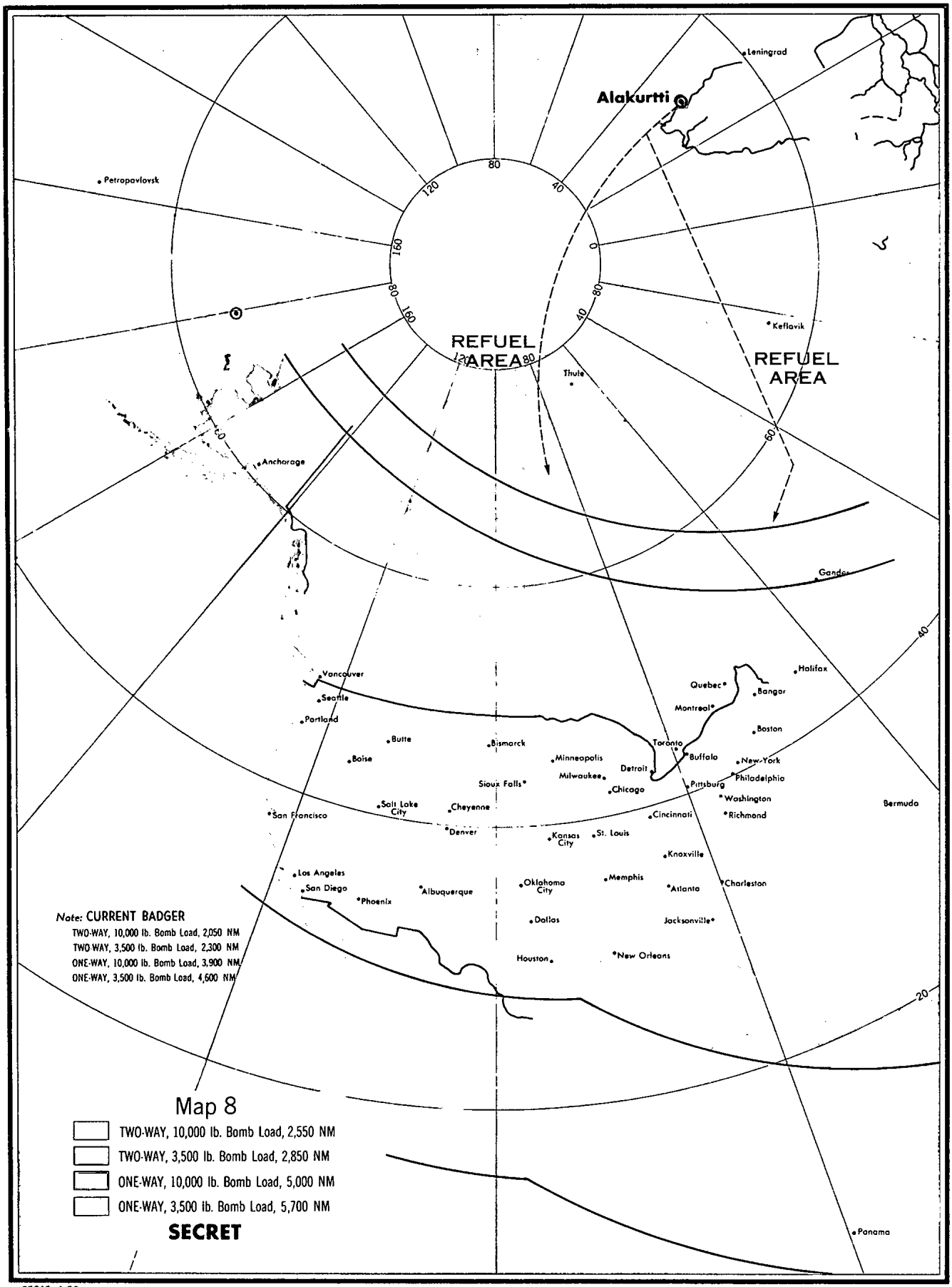


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# TY OF IMPROVED BISON, UNREFUELED

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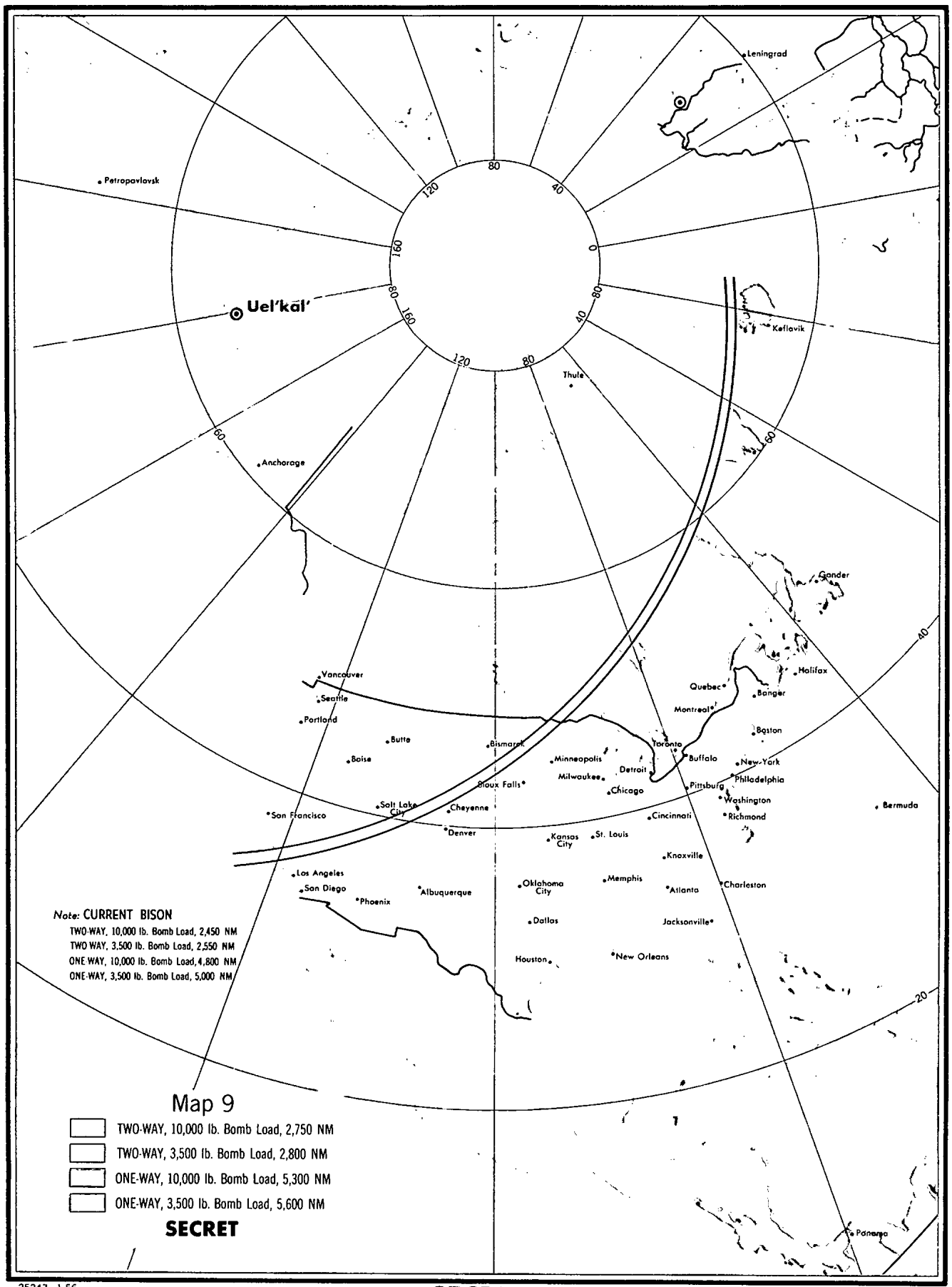


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# CITY OF IMPROVED BISON, UNREFUELED

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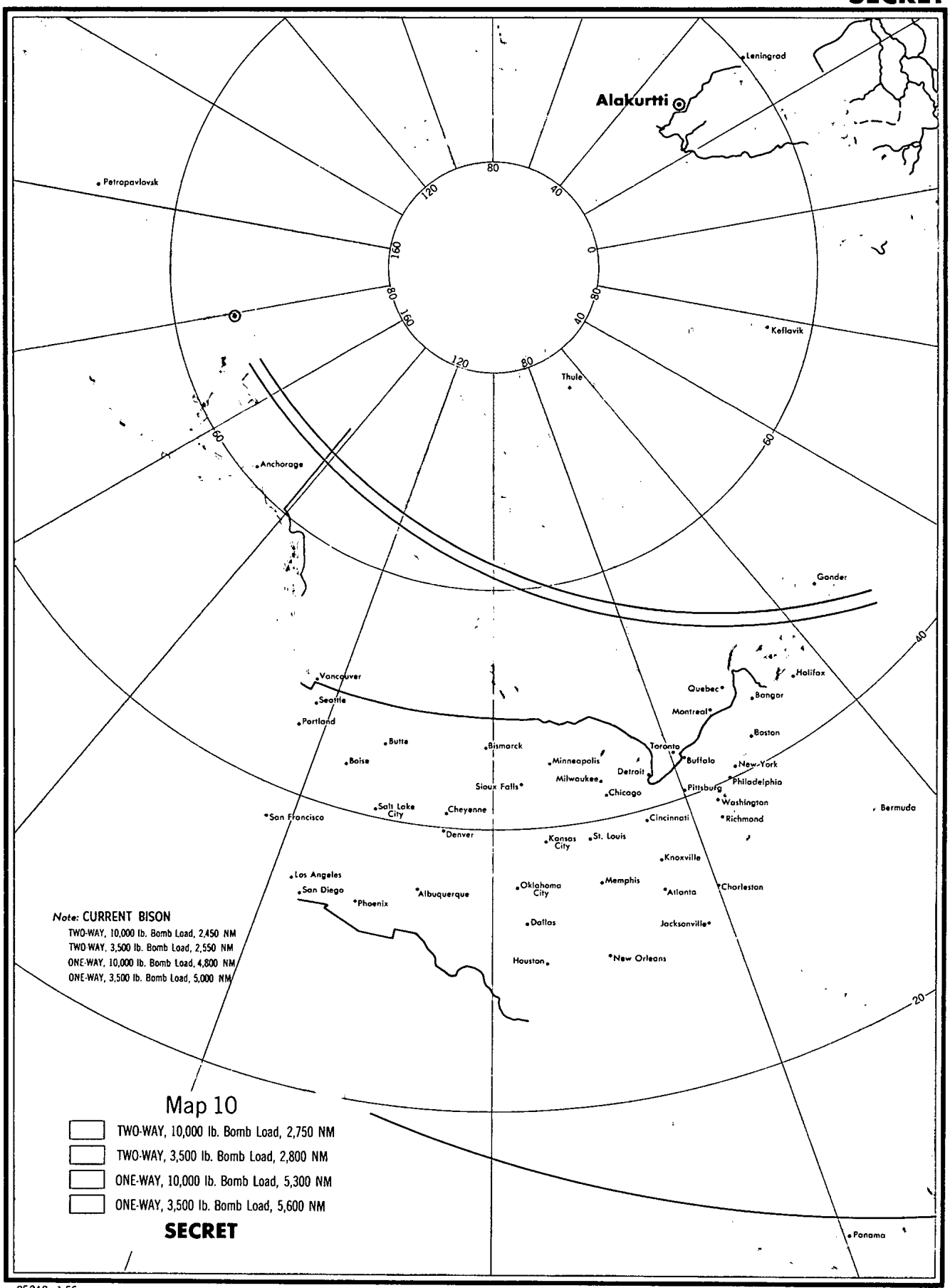


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# CAPACITY OF IMPROVED BISON, REFUELED

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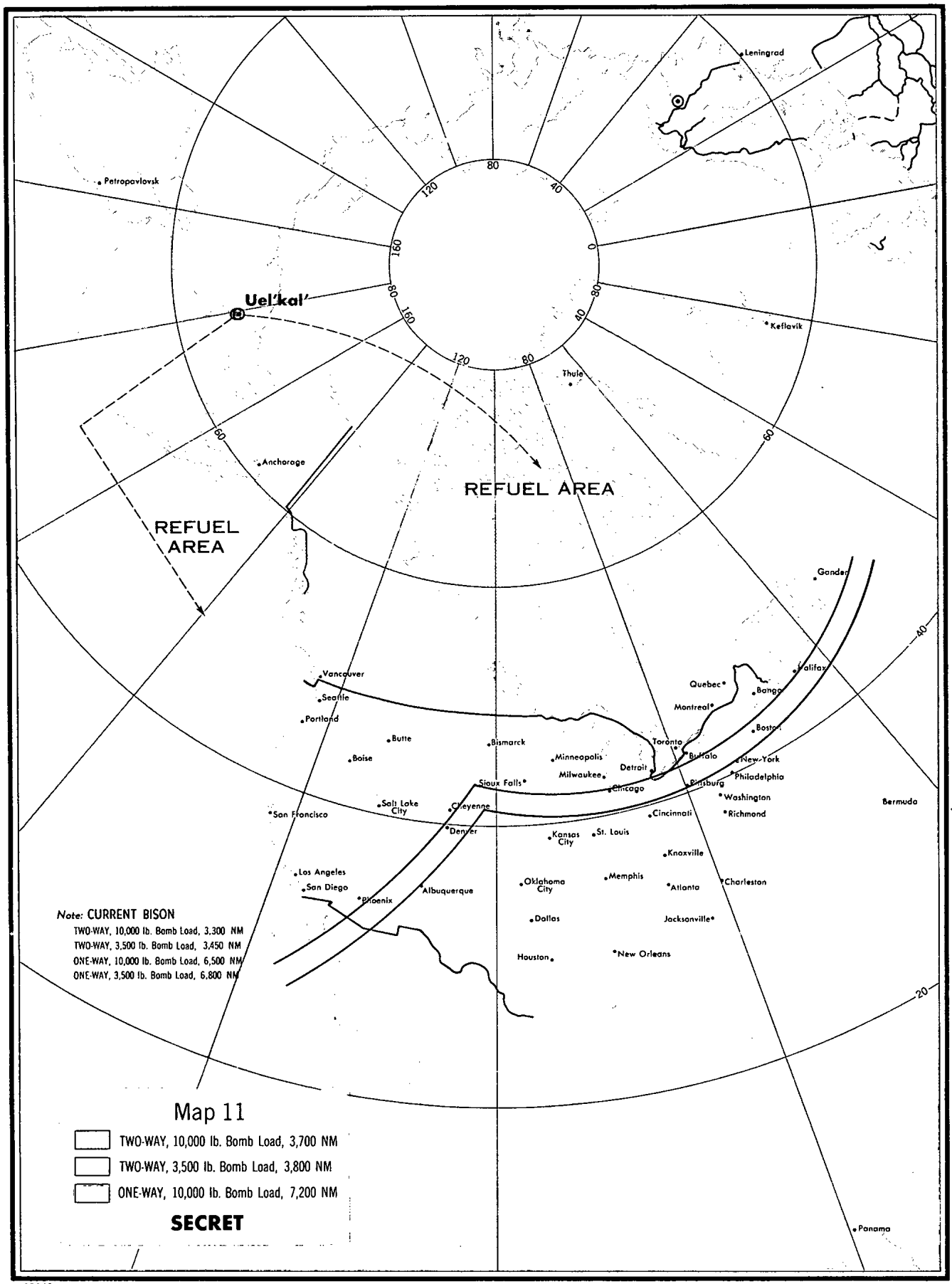


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# LITY OF IMPROVED BISON, REFUELED

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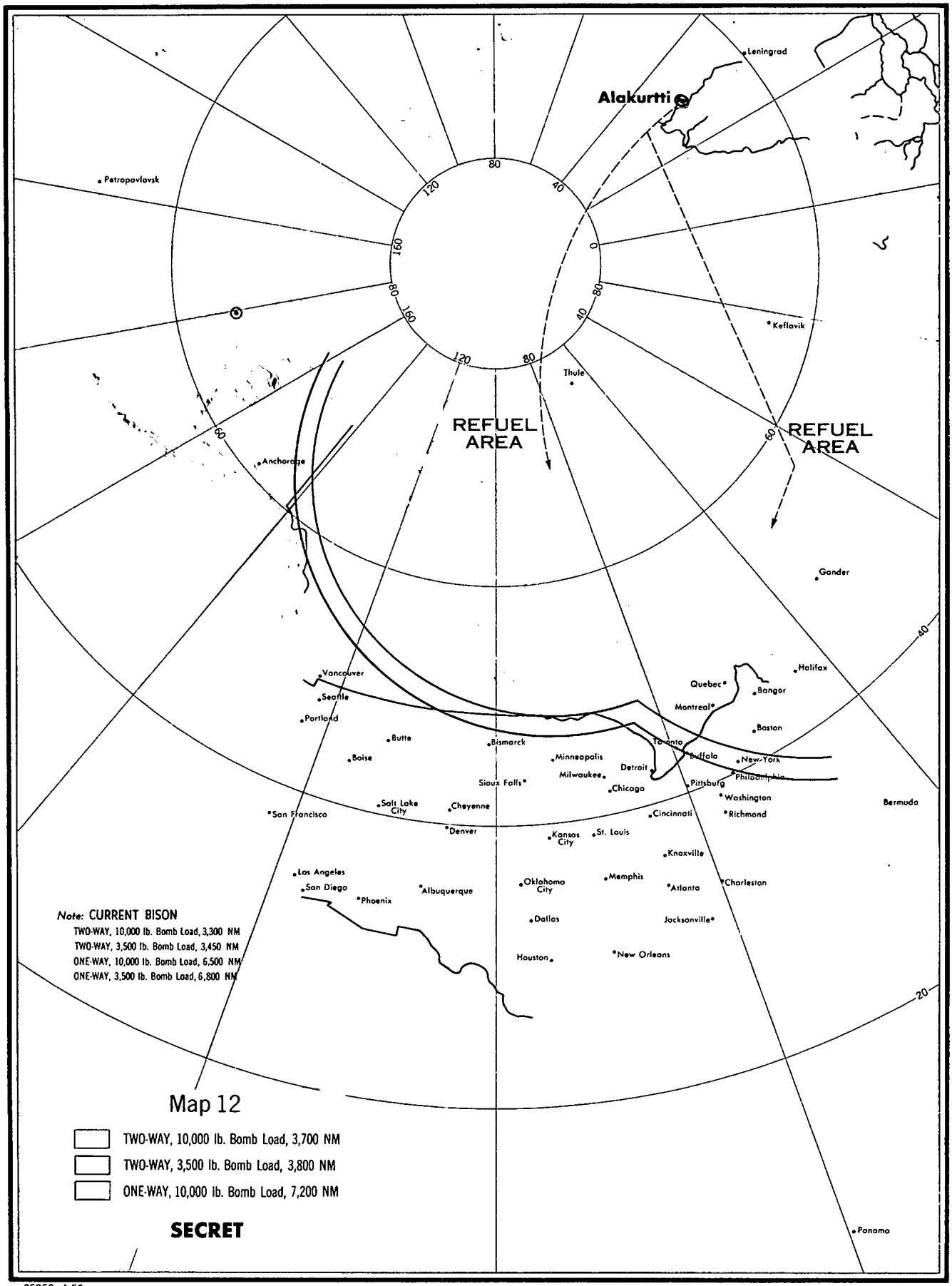


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# 'ABILITY OF BEAR, UNREFUELED

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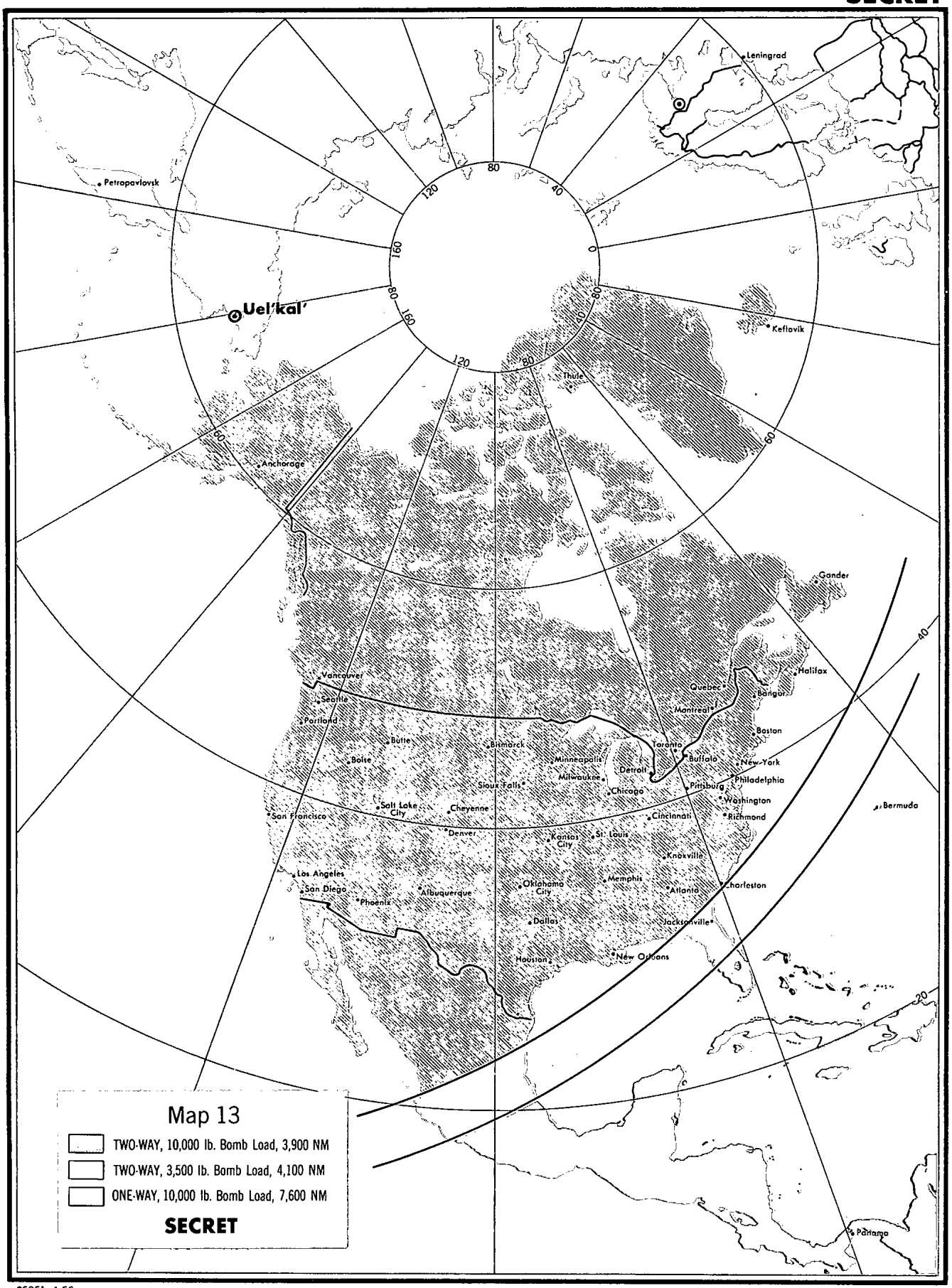


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# PABILITY OF BEAR, UNREFUELED

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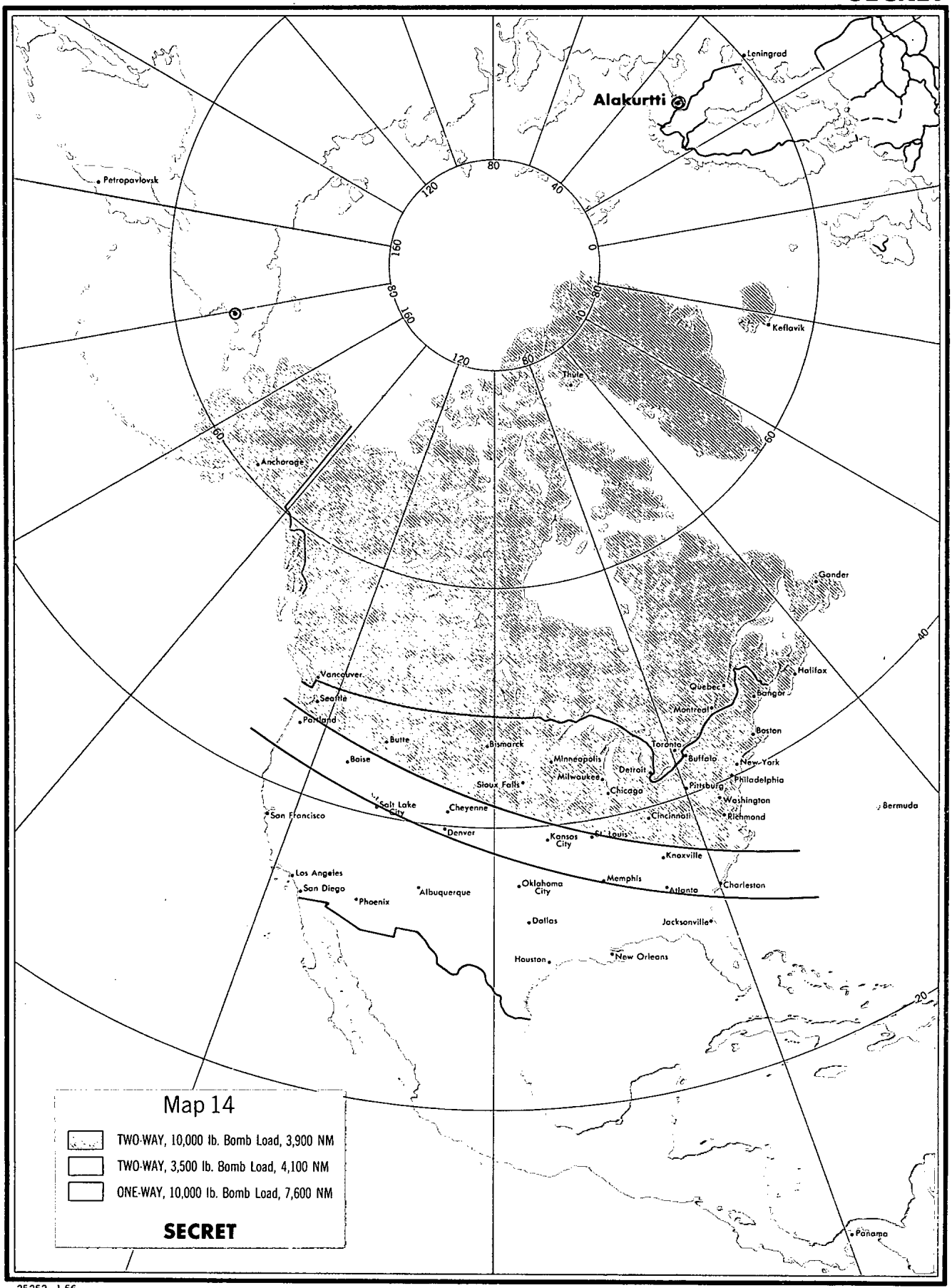


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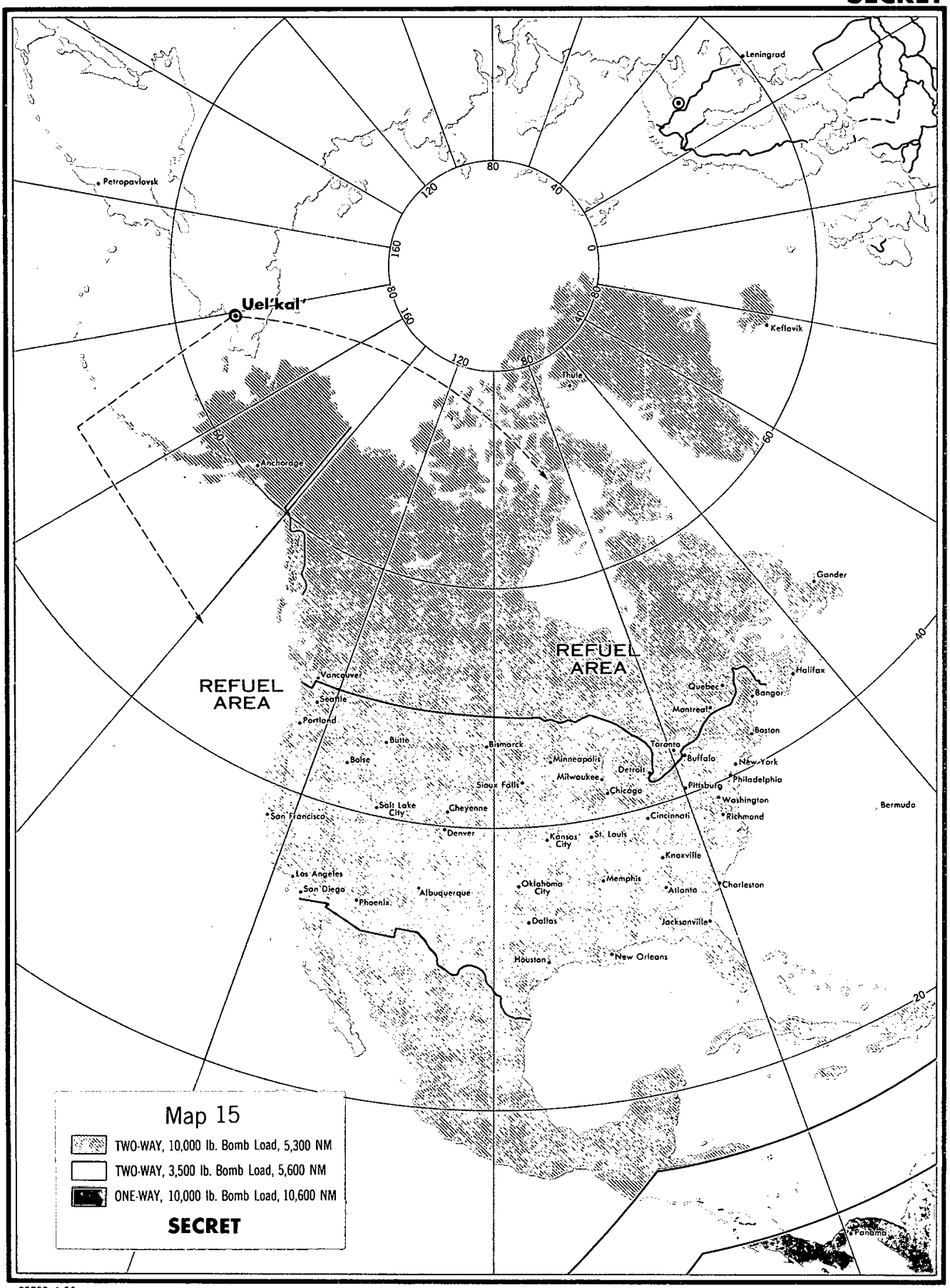


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# ...PABILITY OF BEAR, REFUELED

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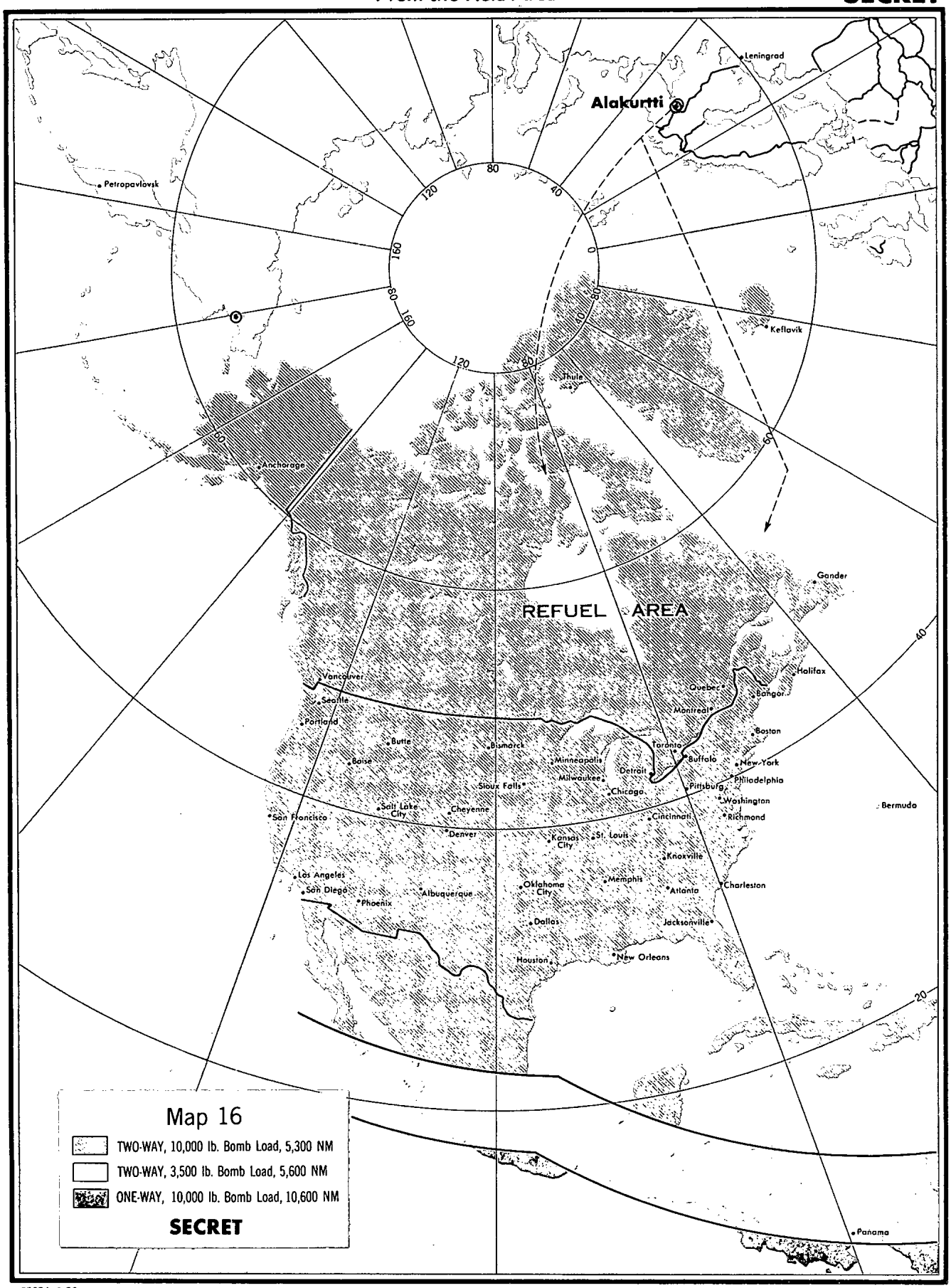


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# IY OF IMPROVED BISON, UNREFUELED

*From Selected Interior Bases*

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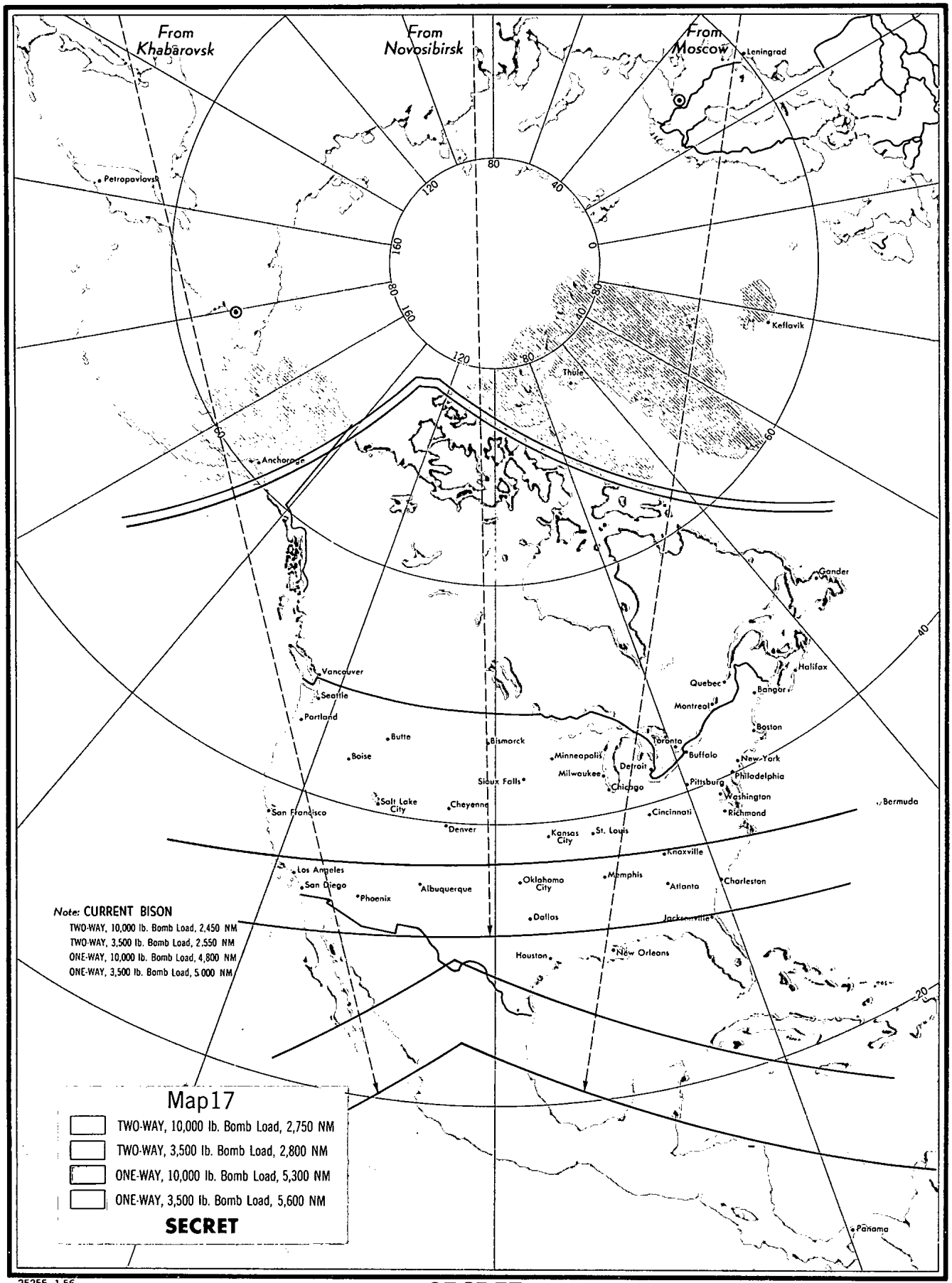


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# CITY OF IMPROVED BISON, REFUELED

*From Selected Interior Bases*

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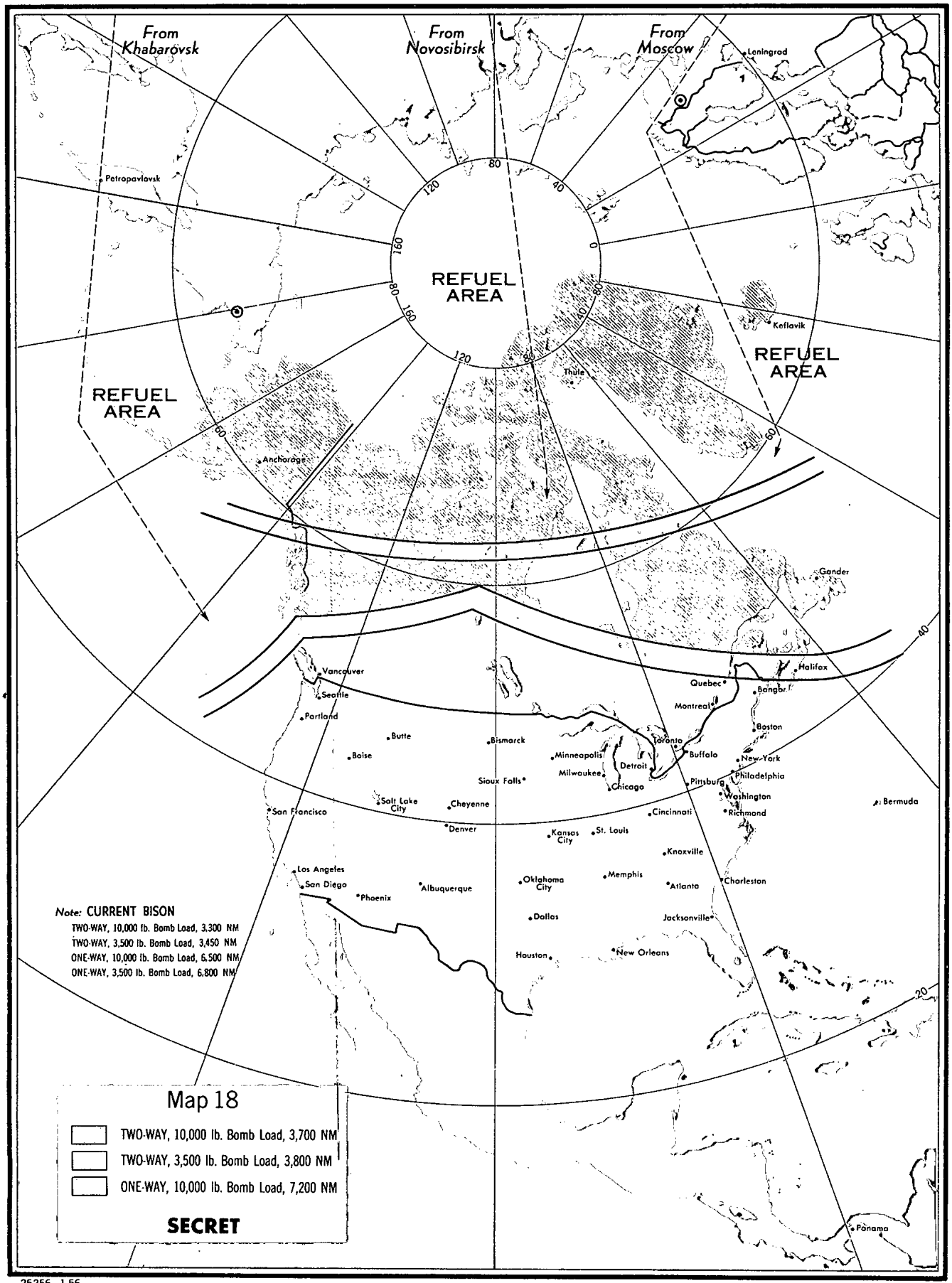


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# PABILITY OF BEAR, UNREFUELED

*From Selected Interior Bases*

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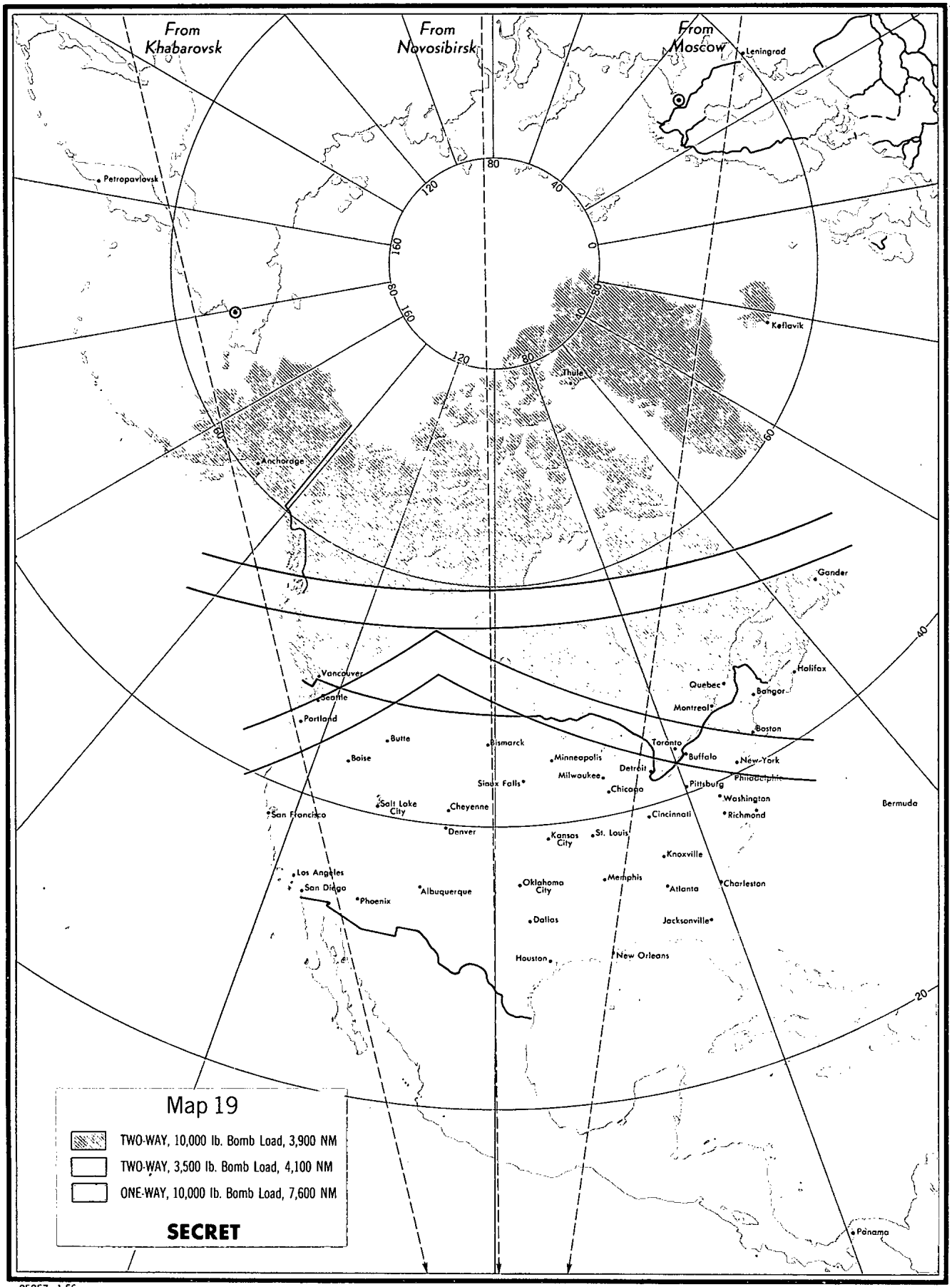


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# APABILITY OF BEAR, REFUELED

*From Selected Interior Bases*

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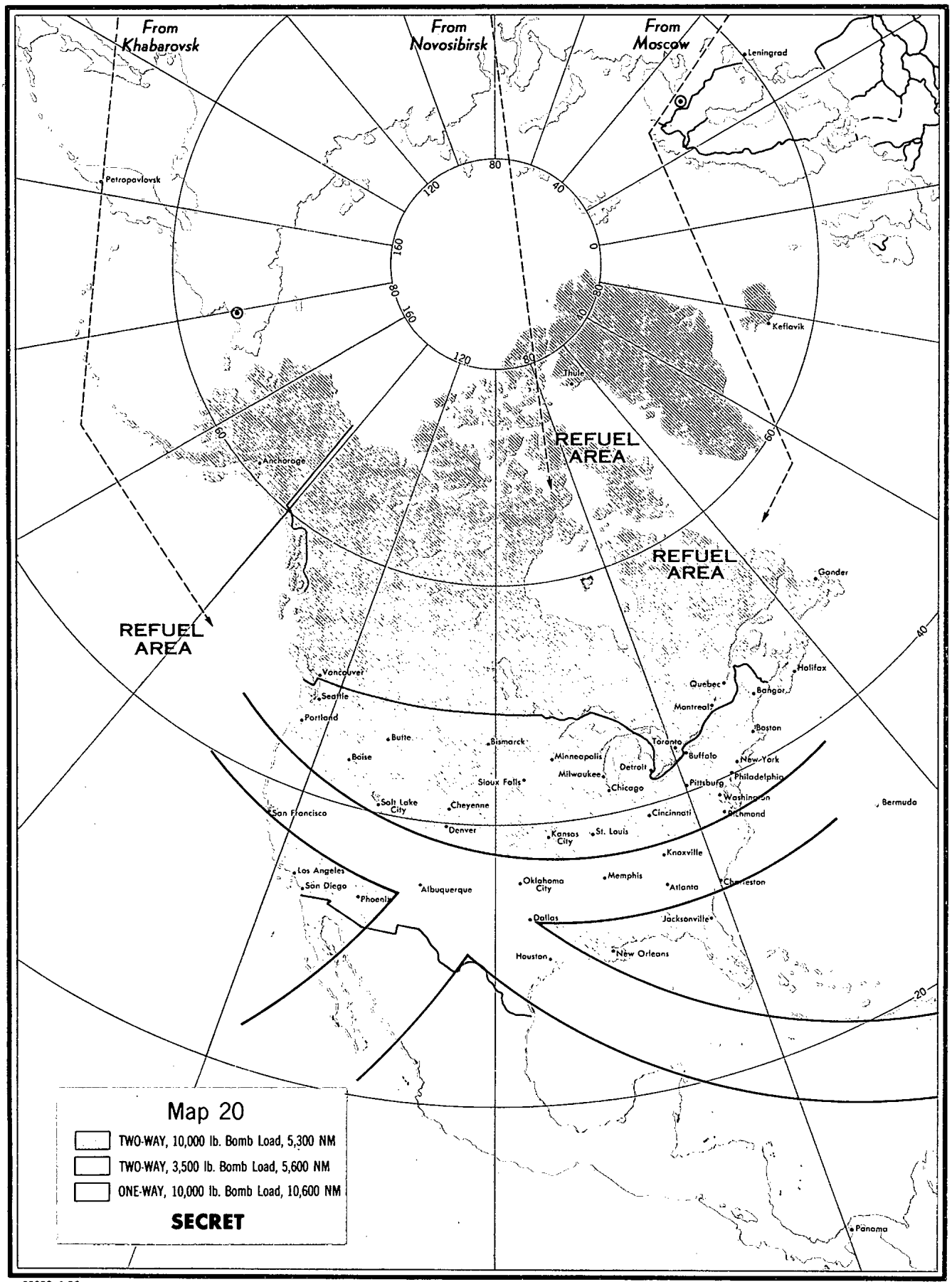


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# SELECTED AIRCRAFT CAPABILITIES AGAINST KEY US OVERSEAS TARGETS

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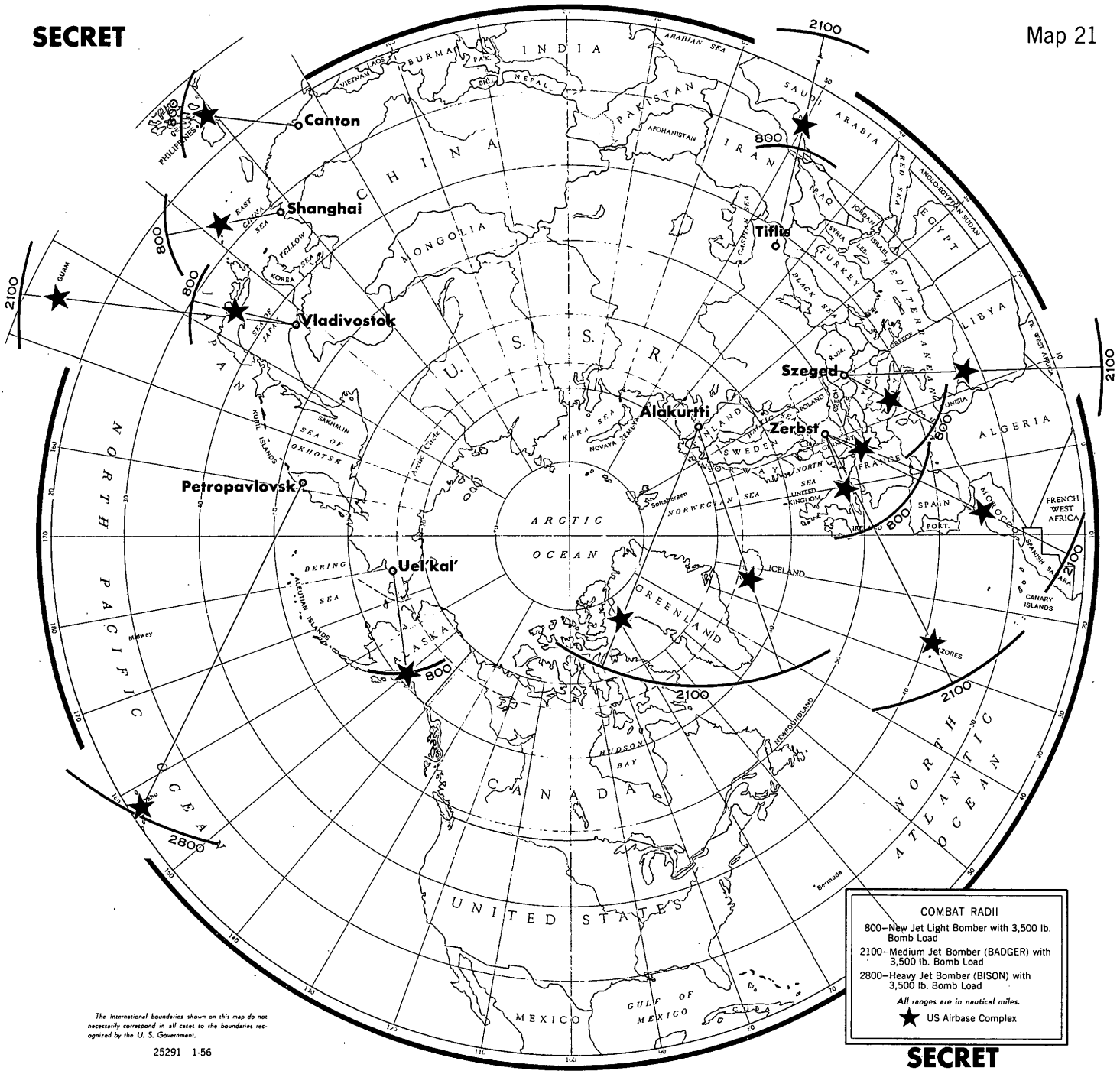
Map 21




COMBAT RADII

800–New Jet Light Bomber with 3,500 lb. Bomb Load

2100–Medium Jet Bomber (BADGER) with 3,500 lb. Bomb Load

2800–Heavy Jet Bomber (BISON) with 3,500 lb. Bomb Load

*All ranges are in nautical miles.*

★ US Airbase Complex

*The international boundaries shown on this map do not necessarily correspond in all cases to the boundaries recognized by the U. S. Government.*

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ESTIMATED

# SURFACE TO SURFACE MISSILE CAPABILITIES AGAINST KEY US AND OVERSEAS TARGETS

## Including Submarine Launched Missile Capability Against the Continental US

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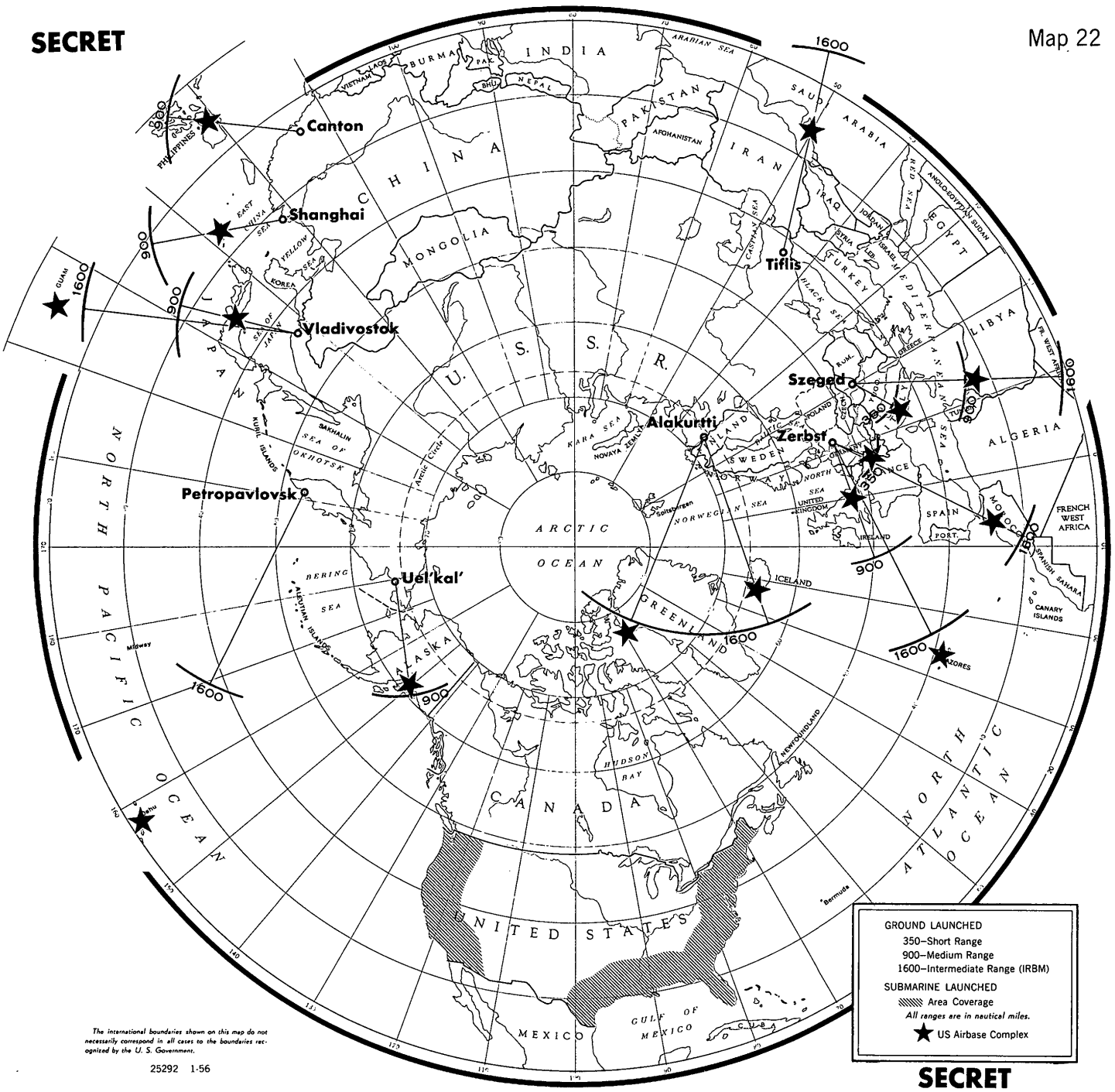
Map 22




The international boundaries shown on this map do not necessarily correspond in all cases to the boundaries recognized by the U. S. Government.

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# ANNEX C

## TABLE I

### ESTIMATED PERFORMANCE OF SOVIET LONG-RANGE AIRCRAFT

(Calculated in accordance with US Mil-C-5011A Spec)

| CONDITIONS | BULL | MODIFIED BULL | BADGER |
|---|---|---|---|
| Combat Radius/Range (nm) | | | |
| *a.* 25,000 lb. bomb load one refuel [a] | ... | ... | ... |
| *b.* 10,000 lb. bomb load one refuel [a] | 1,700/3,100<br>2,300/4,200 | 2,000/3,600<br>2,700/4,900 | 1,500/2,900<br>2,050/3,900 |
| *c.* 3,500 lb. bomb load one refuel [a] | 1,950/3,500<br>2,650/4,700 | 2,300/4,100<br>3,100/5,500 | 1,700/3,400<br>2,300/4,600 |
| Speed/Altitude (kn/ft) | | | |
| *a.* Max speed/optimum altitude | 350/30,000 | 360/30,000 | 545/12,500 |
| *b.* Target speed/altitude | 310/30,000 | 340/35,000 | 475/41,000 |
| Combat Ceiling (ft.) | 36,500 | 37,500 | 45,000 |

### ESTIMATED PERFORMANCE OF SOVIET LONG-RANGE AIRCRAFT

(Calculated in accordance with US Mil-C-5011A Spec)

| CONDITIONS | IMPROVED [b] BADGER | BISON | IMPROVED [b] BISON | BEAR |
|---|---|---|---|---|
| Combat Radius/Range (nm) | | | | |
| *a.* 25,000 lb. bomb load one refuel [a] | ...<br>... | 2,200/4,300<br>3,000/5,800 | 2,500/4,700<br>3,400/6,400 | 3,500/6,600<br>4,750 |
| *b.* 10,000 lb. bomb load one refuel [a] | 1,900/3,700<br>2,550/5,000 | 2,450/4,800<br>3,300/6,500 | 2,750/5,300<br>3,700/7,200 | 3,900/7,600<br>5,300 |
| *c.* 3,500 lb. bomb load one refuel [a] | 2,100/4,200<br>2,850/5,700 | 2,550/5,000<br>3,450/6,800 | 2,800/5,600<br>3,800/7,600 | 4,100/8,200<br>5,600 |
| Speed/Altitude (kn/ft) | | | | |
| *a.* Max speed/optimum altitude | 550/12,500 | 540/19,000 | 540/19,000 | 495/21,400 |
| b. Target speed/altitude | 470/43,000 | 475/41,500 | 475/44,500 | 435/40,000 |
| Combat Ceiling (ft.) | 43,000 | 43,600 | 46,500 | 40,700 |

[a] Refueling estimates based on the assumption that the USSR develops and produces compatible tankers which will provide approximately 35 percent increase in radius/range.

[b] Improvements include the replacement of the 18,000 lb. thrust engines with those having a thrust of 20,500 lbs.



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TABLE II

ESTIMATED SOVIET LONG-RANGE AIRCRAFT PERFORMANCE UNDER AN OPTIMUM MISSION PROFILE

(Calculated in accordance with US Mil–C–5011A Spec except that fuel reserves are reduced to permit a maximum of 30 minutes loiter at sea level, and aircraft operate at altitudes permitting maximum radius/range)

| CONDITIONS | BULL | MODIFIED BULL | BADGER |
|---|---|---|---|
| Combat Radius/Range (nm) | | | |
| *a.* 25,000 lb. bomb load one refuel [a] | ... | ... | ... |
| *b.* 10,000 lb. bomb load | 1,800/3,300 | 2,150/4,000 | 1,600/3,100 |
| one refuel [a] | 2,400/4,500 | 2,900/5,400 | 2,200/4,200 |
| *c.* 3,500 lb. bomb load | 2,050/3,700 | 2,450/4,600 | 1,850/3,700 |
| one refuel [a] | 2,750/5,000 | 3,350/6,200 | 2,500/5,000 |
| Speed/Altitude (kn/ft) | | | |
| *a.* Max speed/optimum altitude | 350/30,000 | 360/30,000 | 545/12,500 |
| *b.* Target speed/altitude | 310/30,000 | 340/35,000 | 475/42,000 |
| Combat Ceiling (ft.) | 36,500 | 37,500 | 45,500 |
| Terminal Target Altitude (ft.) [b] | | | |
| *a.* 25,000 lb. load | ... | ... | ... |
| *b.* 10,000 lb. load | ... | ... | 49,500 |
| *c.* 3,500 lb. load | ... | ... | 51,000 |

[a] Refueling estimates based on the assumption that the USSR develops and produces compatible tankers which will provide approximately 35 percent increase in radius/range.

[b] Service ceiling at maximum power with one hour fuel reserves plus bomb load aboard. No range figure is associated with this altitude.



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TABLE II (continued)

ESTIMATED SOVIET LONG-RANGE AIRCRAFT PERFORMANCE UNDER AN OPTIMUM MISSION PROFILE

(Calculated in accordance with US Mil-C-5011A Spec except that fuel reserves are reduced to permit a maximum of 30 minutes loiter at sea level, and aircraft operate at altitudes permitting maximum radius/range)

| CONDITIONS | IMPROVED [c] BADGER | BISON | IMPROVED [c] BISON | BEAR |
|---|---|---|---|---|
| Combat Radius/range (nm) | | | | |
| *a.* 25,000 lb. bomb load | . . . | 2,500/4,800 | 2,800/5,300 | 3,800/7,200 |
| one refuel [a] | . . . | 3,400/6,500 | 3,800/7,200 | 5,100/. . . |
| *b.* 10,000 lb. bomb load | 2,050/4,000 | 2,800/5,400 | 3,100/6,100 | 4,250/8,300 |
| one refuel [a] | 2,750/5,400 | 3,800/7,300 | 4,200/8,200 | 5,750/. . . |
| *c.* 3,500 lb. bomb load | 2,300/4,500 | 2,900/5,700 | 3,200/6,400 | 4,500/8,900 |
| one refuel [a] | 3,100/6,100 | 3,900/7,700 | 4,300/8,600 | 6,100/. . . |
| Speed/Altitude (kn/ft) | | | | |
| *a.* Max speed/optimum altitude | 550/12,500 | 540/19,000 | 540/19,000 | 495/21,600 |
| *b.* Target speed/altitude | 470/43,500 | 475/42,400 | 475/45,500 | 410/42,100 |
| Combat Ceiling (ft.) | 43,000 | 44,600 | 47,500 | 41,300 |
| Terminal Target Altitude (ft.) [b] | | | | |
| *a.* 25,000 lb. load | . . . | 52,600 | 55,200 | 48,200 |
| *b.* 10,000 lb. load | 51,500 | 53,200 | 56,000 | 50,200 |
| *c.* 3,500 lb. load | 53,000 | 54,600 | 57,000 | 51,200 |

[a] Refueling estimates based on the assumption that the USSR develops and produces compatible tankers which will provide approximately 35 percent increase in radius/range.

[b] Service ceiling at maximum power with one hour fuel reserves plus bomb load aboard. No range figure is associated with this altitude.

[c] Improvements include the replacement of the 18,000 lb. thrust engines with those having a thrust of 20,500 lbs.



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TABLE III

ESTIMATED 1956–1959 PERFORMANCE CHARACTERISTICS OF SOVIET JET LIGHT BOMBERS

| Type | Bomb Load (lbs.) | Combat Radius/ Range (nm/nm) | Max. Spd./ Alt. (kn/ft) | Combat Ceiling (ft.) |
|---|---|---|---|---|
| BEAGLE (IL–28) | | | | |
| *a.* Internal fuel | 4,400 | 590/1,165 | 440/30,000 | 37,000 |
| *b.* Internal fuel | 6,600 | 570/1,100 | 440/30,000 | 37,000 |
| *c.* External fuel | 4,400 | 690/1,365 | 440/30,000 | 37,000 |
| *d.* External fuel | 4,400 | 595/1,180 | 450/ sea level | low level attack |
| BOSUN (TU–14) | | | | |
| *a.* Internal fuel | 4,400 | 765/1,510 | 455/30,000 | 39,500 |
| *b.* Internal fuel | 2,000 | 700/1,390 | 465/ sea level | low level attack |
| NEW JET LIGHT BOMBER 1956 | 4,400 | 800/1,500 | 500/35,000 | 48,000 |



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